Losing the gains from trade
Evidence from the trade multiplier of the Great Depression ☆

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Abstract

How do macroeconomic crises spread from developed economies to the rest of the world? To what extent does the fate of small open economies depend on the economic powerhouses of the world? Drawing on evidence from the mother of all modern economic crises, the Great Depression, this study sets out to shed light on these questions. Making use of cross-sectional and time-series variation deeply rooted in the history and geography of trade, a causal estimate of the foreign trade multiplier allows me to assess the role of trade destruction in the fall of incomes during the 1930s. Indeed, the trade channel can explain large parts of the downturn in small open economies. If there had not been a fall in export demand, some countries would not have suffered a downturn in the initial phase of the Depression at all.

Keywords: Great Depression; Multiplier; Trade; Crisis Transmission

☆Without implicating, I thank Natasha Postel-Vinay, Olivier Accominotti, Albrecht Ritschl, Barry Eichengreen, Nick Crafts, Michael Bordo, Andrea Papadia, Oliver Bush as well as seminar participants at LSE and Humboldt University as well as conference participants at the LSE Interwar Economic History Workshop for comments and suggestions. The financial support of the ESRC is gratefully acknowledged. All errors are mine.

Introduction

The Great Depression spread through three channels: the gold standard,[1] financial linkages,[2] and trade.[3] While the first two channels have been the focus of much attention in the empirical literature, much less is known about the relative significance of the trade channel. Resurrecting the concept of the foreign trade multiplier, this study sets out to test its predictive power in a causal manner. The insights (i) that three economic powerhouses (Germany, Great Britain, the United States) absorbed a third of world imports,[4] (ii) that the extent of the crisis varied substantially across them, and (iii) that small open economies traded to varying degrees with them, allow me to isolate the importance of the trade channel. Indeed, much of the fate of the small open economies in terms of the initial depth of the crisis can be explained by the loss of export markets. No domestic policy change could have made these countries immune to the global economic crisis emanating from the large economies.

Research on the international extent of the Great Depression in recent decades has focused on the gold standard channel. Not only did the gold standard transmit the crisis through monetary policy shocks, but the gold orthodoxy across the world was itself causal to the severity of the Depression (Eichengreen and Sachs, 1985; Bernanke, 1995). In an effort to defend their gold parities, central banks around the world had kept interest rates at high levels and caused deflation (Eichengreen, 1992). Typically, the gold standard literature has highlighted two mechanisms through which deflation depressed the respective countries' economies. Firstly, wages were particularly sticky during this period. Falling prices translated relatively constant nominal wages into increasing real wages, which depressed output (Bernanke and Carey, 1996). Secondly, debt deflation translated into financial crises (Fisher, 1933). Not only had the gold standard ultimately caused the crisis, but its architecture also prevented the appropriate policy response. Because of the widespread prohibition of open market operations due to the hyperinflation experience in the early 1920s, central banks around the globe were unable to act as a lender of last resort. The resulting unfettered banking crises deepened the Depression in many countries (Bernanke and James, 1991). Like the sticky wage mechanism, the financial crisis mechanism does not take into account the international contagion of the crisis *per se*. The crisis impulse, while rooted in the constrains of the international monetary system, originates in domestic monetary policy.

Yet, international financial linkages mattered for the spread of the Depression. Temin (1993) speculates about the importance of global financial linkages, especially with regards to the European financial crisis of 1931. Indeed, Accominotti (2012, forthcoming) provides

[1] See, for example, Eichengreen (1992) and Bernanke (1995).

[2] See, for example, Temin (1993) and Accominotti (2012, forthcoming).

[3] For the potential relevance of the trade channel, see the back-of-the envelope calculations by Irwin (2012, p. 110f) and Grossman and Meissner (2010). The "lost" gains from trade during this period in the long-run study by Federico and Tena-Junguito (2017) can be interpreted in a similar manner.

[4] Own calculation based on League of Nations (1937, p. 214f).

balance sheet evidence that international financial contagion mattered a great deal.[5] There is little question about the relevance of the financial contagion channel and the gold standard channel for propelling the Great Depression around the globe. However, these explanations do not include another important link for the internationalisation of the crisis.

Beyond the gold standard channel, contemporaries such as Polak (1939) pointed to a non-monetary and non-financial channel of the Depression. Based on the insights from Harrod's (1933) foreign trade multiplier, they attributed the severity of the Depression in small countries in part to the loss of export markets.[6] Both the fall in income in the trading partners' economies and the increasing prevalence of protectionism led to decreasing export opportunities. Given its relevance to contemporary scholars, it is surprising that the trade multiplier features relatively little in the historiography of the Great Depression.[7] The back-of-the-envelope calculations by Irwin (2012, p. 110f) and Grossman and Meissner (2010) provide notable exceptions highlighting the potential relevance of the trade channel. However, the very nature of such calculations warrants closer examination.

Most likely, the lack of a thorough empirical assessment emanates from three factors. Firstly, the view that the fall in world trade and rise of trade barriers were ultimately a consequence of the Depression, and not its cause, might have tamed the appetite to deal with this question.[8] However, even if we were to accept this view generally, it does not follow

[5]For more empirical evidence on the importance of international capital flows at the macro level, see also Accominotti and Eichengreen (2016). By focusing on the transmission rather than the causes of the Depression, the financial contagion view accommodates a host of other explanations for the crisis in the advanced countries beyond the gold standard. For example, Romer (1990, 1993) on the stock market crash, Ritschl (2002) on the German transfer problem, and recent work on banking in the United States (Mitchener and Richardson, forthcoming).

[6]See in particular the more general outline of the argument by Harrod (1933, p. 143f). The historiographical journey of the foreign trade multiplier from its inception by Harrod until today is an intellectual curiosity. Harrod had postulated it in the early 1930s based on the short-run macroeconomic fluctuations surrounding him. It was fiercely debated in the 1950s by eminent economists such as Stolper (1947) and Polak (1956). Thirlwall and Hussain (1982) linked the export multiplier to the development economics debate and focused on long-run effects. At the same time, a negligence of the short-term dynamics, the initial explicandum, started to prevail and carries on until today. This is even more surprising given the importance typically attached to trade in the business cycle comovement literature (see e.g. Baxter and Kouparitsas, 2005).

[7]This is not to say that there is little research on trade in the 1920s and 1930s. Researchers have investigated the role of trade blocs in great depth (Eichengreen and Irwin, 1995; Wolf and Ritschl, 2011; Gowa and Hicks, 2013), accounted for the role of income, tariffs, and non-tariff barriers in the fall of world trade (Madsen, 2001), analysed determinants of tariff setting (Eichengreen and Irwin, 2010), and highlighted the economic policy dimension of the "trade policy disaster" (Irwin, 2012). Put simply, the effects of the Depression on trade are well-researched. However, we know much less, in particular empirically, on the opposite direction of causation.

[8]This view is best-reflected in Eichengreen and Irwin (2010) and Irwin (2012), who link the rise of trade barriers and fall of trade to the gold standard. It is important to point out that the work by these authors does not preclude the possibility that trade was a contributing factor. Irwin (2012) even provides a back-of-the-envelope calculation for the potential role of trade destruction on income.

that trade destruction had no impact on incomes. More generally, analysing contributing causes of the Great Depression has led to valuable insights in the past.[9] Secondly, the lack of high-frequency macroeconomic data has so far provided little variation to exploit. Thirdly, severe endogeneity problems loom large when dealing with the question of the effect of trade on income.[10] This study provides a remedy for the last two factors. Relying on additional data collection and the new *Interwar Macroeconomic Dataset* (Albers, 2018), it provides the necessary macroeconomic data for the empirical analysis. Furthermore, I propose a novel identification strategy to estimate the causal effect of the loss of export markets on income.

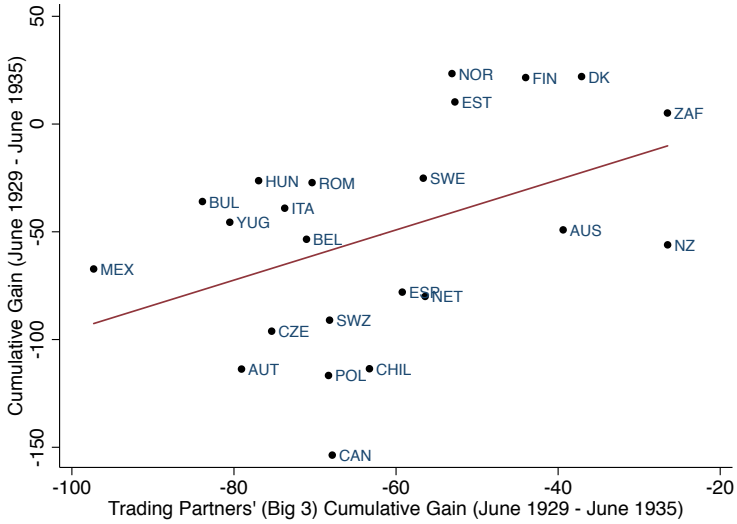


Figure 1: The loss of foreign demand and the severity of the Great Depression in small open economies

Note: The axes are scaled in percentages of the corresponding June 1929 GDP. The trading partners' GDP is the weighted average of the GDP of the United States, Great Britain, and Germany according to the corresponding trade shares in 1927.

Figure 1 provides a first informative correlation regarding the importance of foreign markets for the severity of the Depression. The x-axis shows the foreign demand that the small country faces. It is defined as the cumulative GDP loss in the *big three* importing nations (Germany, Great Britain, and the United States), weighted by their respective pre-crisis shares in the export market of the small country.[11] The y-axis displays the cumulative GDP loss for the small country. The regression line provides a first indication that the varying exposure to the global crisis was an important predictor for the severity of the Depression in the small

[9] Romer's (1990) treatise on the effects of the stock market crash serves as a case in point. For the transmission of the crisis, see, for example, the analysis of business cycle comovement by Mathy and Meissner (2011).

[10] In this context, the conflicting results in the tariff-growth paradox debate may serve as a reminder (Clemens and Williamson, 2004; Schularick and Solomou, 2011).

[11] Note that all variation on this axis thus originates in the export weights.

countries. This correlation is informative and yet unsatisfactory. It neither provides causal evidence nor does it highlight the precise mechanism. To do so, high frequency data and a precise empirical modelling of the export channel is needed.

Using a panel of quarterly data for 23 small economies, I estimate the effect of exports on GDP. History and geography allow me to deal with the looming endogeneity concerns, in particular omitted variable bias. A quarterly measure of foreign demand based on the same principle as in the figure above serves as an excellent instrument for a country's total exports. It is safe to assume that economic fluctuations in a small country do not affect the business cycle of either of the three large countries.[12] At the same time, variations in foreign demand exerted strong influence on a country's export opportunities. Like in the figure above, the variation in foreign demand originates in pre-crisis trade patterns. These patterns are themselves a function of history and geography and thus reasonably exogenous in the short-run. The panel setup also allows me to control for the world demand itself at any given point in time and thus identify the causal effect from the variations around it. Satisfying the exclusion and relevance criteria, foreign demand from the large countries thus serves as an instrumental variable for the ability to export. A framework akin to the fiscal multiplier literature (Barro and Redlick, 2011) allows me to isolate the trade multiplier. The estimated impact (contemporaneous) multiplier is around 1.2, signalling that for every 1 % decrease in exports (in terms of GDP), 1.2 % of GDP are lost. Most conservatively, assuming full future balancing of trade beyond the contemporaneous adjustment and neglecting any potential dynamic effects caused by the multiplier, the estimate reduces to 0.7. This is still a very sizeable multiplier effect solely based on the (lost) gains from trade. The logic of the instrument provides a straightforward way to verify the results through a placebo study. Using a miniature version of the gravity model, I predict trade shares in 1927 in the absence of (colonial) history and rotating the geography of the main trading partners. Shutting down history and reversing geography, the results of the model become insignificant, as they should be.

What are the implications of the causal estimate of the multiplier for the course and spread of the Great Depression? How much of the Depression was due to the loss in foreign demand? Combining the multiplier estimates with data on the loss of exports and the initial depth of the Depression allows me to account for the share of income destruction due to the loss of foreign markets. For most countries, the trade channel explains more than 50 % of the initial downturn. For a small number of countries, it over-explains the initial crisis. Put differently, in the absence of the loss of export markets and all other things equal, some countries might not have suffered a downturn in the initial phase of the Depression at all.

The remainder of this paper is organised as follows. Section 1 reviews the literature on trade and the Depression through the lenses of the research question put forward in this study.

[12] This assumption is a staple in the literature on small open economies (see e.g. Gali and Monacelli, 2005).

Section 2 outlines the empirical framework and data sources, including newly collected price indices for exports and trade patterns. Section 3 discusses the results. Section 4 concludes and highlights potential avenues for future research.

1. International Trade and the Great Depression

What was the relative importance of income, trade policy, geography, and history for the breakdown in world trade? How did they influence each other? The brief review of the literature in light of these questions suggests that loss of foreign demand and tariffs were of similar importance for the breakdown of trade. Tariffs, however, changed the geographic trade patterns only to a limited degree. Furthermore, the review highlights an important void in our understanding of the Great Depression. With few exceptions, studies on the course of interwar trade focus on trade as an outcome, not a contributing factor to the Great Depression. Evidence on the reverse direction of causation remains very limited and constitutes a major gap in the research on the Great Depression.[13]

The focus of the literature on the Great Depression has long been on its ultimate causes in the United States and abroad (Friedman and Schwartz, 1963; Eichengreen, 1992; Bernanke, 1995). Because the breakdown in trade is not considered to be part of this set of causes, it is mostly analysed as a consequence of the Depression rather than a contributing factor. Given its link to the monetary system, the dominant explanation for interwar protectionism falls at least partially into this category. According to Eichengreen and Irwin (2010) and Irwin (2012), policymakers found themselves in a trilemma. They could only choose two of the following three options: independent monetary policy, sustaining the gold standard parity, and open trade.[14] As the Depression deepened those policymakers who were bound by the infamous gold orthodoxy (Eichengreen, 1992) resorted to protectionist measures. In contrast, those who had left the gold standard were relatively less inclined to increase trade barriers.[15] What, however, was the effect of these trade restrictions on the volume and geography of trade in the interwar period? How does their effect compare to the losses in trade induced by changes in national income?

The 1930s saw a massive fall in world trade. From its peak in 1929 until its trough in 1932, real world trade fell by about 25 % (Irwin, 2012, p. 102). Tariff and non-tariff barriers can explain around 14 % of this drop, whereas the other 11 % are accounted for by income

[13] Irwin (2012, p. 110), too, makes this point. The application of closed economy DSGE models to obviously open economies such as Belgium provides another example (e.g. Pensieroso, 2011).

[14] As such, it is related to the macroeconomic policy trilemma (Obstfeld and Taylor, 1997).

[15] Given the many parallels drawn between the Great Recession and Great Depression, it is worthwhile to point out that this constitutes a unique feature of the crisis of the 1930s (Irwin, 2012). One reason making Eichengreen's and Irwin's argument so compelling is that it can explain both, the emergence of the protectionism in the 1930s and the absence of it in the current crisis. As today's international macroeconomic environment is governed by flexible exchange rates, there was simply less need to resort to 1930s style protectionism.

losses. Trade barriers continued to grow in the recovery period of 1932–1935. In the absence of a further increase of trade restrictions compared to 1932, trade would have grown by 8 % due to the recovery of incomes around the globe. However, the recovery of world trade only reached 6 % due to ever growing trade restrictions.[16] It is clear that restrictions and income changes alike mattered for the fall and tame rebound of world trade. The effect of trade barriers on the geography of trade, however, is less clear-cut.

Recently, Bromhead et al. (2017) and, to a limited extent, Gowa and Hicks (2013) have resurrected the role of policy for the reorientation of world trade. Both contributions point out that British imperial trade policies redirected trade to within the empire. Yet, these findings do not call into question the general finding of the gravity literature that geographical and historical links between countries are strong predictors of trade flows at any point in time (Head et al., 2010; Head and Mayer, 2014).[17] This was no different for the interwar period as Eichengreen and Irwin (1995) demonstrate. Wolf and Ritschl (2011) argue that this persistence is so strong that taking it into account can nullify the effects found for common currency areas. The gravity literature thus provides little evidence that the oft-cited regionalisation of trade actually took place in the 1930s. These "gravity-based" conclusions are almost certainly too strong as recent evidence presented in this thesis and elsewhere (Bromhead et al., 2017) suggest. What remains undisputed though, is that the geography of trade flows is relatively persistent, at least in the short run. This insight will be important for the empirical specification in this study.

While the effect of policy on trade volumes and its geography is well-studied, the effect of trade destruction on incomes remains a relatively blind spot in the literature on the Great Depression. Income usually features in accounting exercises to explain the fall in world trade, not vice versa. In the analysis of protectionism, the magnitude of the effect of protectionism on income through falling demand is almost never explicitly tested (Irwin, 2012, p. 110). This is all the more surprising as we know that trade links influenced the transmission of the Great Depression. In the vein of the post-war analysis by Baxter and Kouparitsas (2005), Mathy and Meissner (2011) establish that bilateral trade was an important determinant for business cycle comovement during this period. Unfortunately, this tells us little about the magnitude of the effects the trade channel ought to explain. The same holds true for many country case studies based on descriptive data, some of which will be discussed in Section 3.2.

While no comprehensive empirical cross-country study for the interwar period exists, a

[16] These are the calculations by Irwin (2012, p. 104), which are based on the decomposition by Madsen (2001).

[17] Indeed, Frankel and Romer (1999) use this insight to investigate the impact of trade on income. They separate the "geography component" of trade and use it to instrument for actual trade. This allows them to provide an estimate of the long-run relationship between income and trade. See also Irwin (2012) for a discussion. See Head et al. (2010) on the persistence of the effect of colonial ties in the post-war period.

few country-specific studies quantify the effect of trade destruction on income. Crucini and Kahn (1996) and Eichengreen (1986) find small effects of the Smooth-Hawley tariff on the American GDP (though with opposite signs). Irwin's (1998) study supports this notion by showing that the impact of the tariff on trade itself was not as large as one might expect. However, the focus of these studies on the closed and large economy of the United States precludes any extrapolation to the world as a whole. In contrast, two case studies on the Italian Great Depression, using a VAR analysis (Mattesini and Quintieri, 1997) and general equilibrium model (Perri and Quadrini, 2002), indicate the importance of the loss in foreign demand for amplifying the Depression.

Beyond these studies, we have to rely on back-of-the-envelope calculations. Using an estimate of the elasticity of income with respect to trade based on modern data, Irwin (2012, p. 112) presents such a calculation for the world as a whole. Abstracting from changes in income, he conjectures that trade barriers could explain about a tenth in the fall of global income during the Depression. Grossman and Meissner (2010) take income into account and use the trade multiplier. Assuming a trade multiplier of 3, they argue that the fall in trade could have explained a large part of the Depression experience in a small open economy such as Canada (25 % of the 30 % fall in GDP). While illuminating the potential magnitude of the effect of trade destruction on income, such back-of-the-envelope calculations necessarily remain speculative as long as no causal empirical estimate of the foreign trade multiplier is available.[18] This study closes this gap and thus allows us to account for the impact of trade destruction on incomes.

The paucity of evidence on the importance of the fall of foreign demand for the severity of the Depression motivates this study. The existing research on trade and the Great Depression informs the empirical strategy in at least three respects. Firstly, the strong persistence of regional trade patterns as suggested by the gravity literature paves the way for a clean identification of the effect of trade shocks on income. Secondly, the heterogenous tariff responses to the Great Depression have to be accounted for. Finally, with an estimate of the foreign trade multiplier at hand, the relative importance of the trade channel in explaining the Great Depression in small open economies can be measured directly.

2. Framework, Data & Empirical Strategy

Before delving into the data description and presenting the precise estimation framework, it is worthwhile to fix the ideas that will guide the empirical analysis. The framework presented in the first part of this section links the domestic economy with foreign demand

[18] The only ones available are those by Friedman (1978) for 12 European countries. They suggest a much lower value for the multiplier than Grossman and Meissner (2010) assume. They are based on estimates of the marginal propensity to consume (see Section 2.1 for a short discussion of such an approach). Given the lack of sufficient data on which these estimates are based upon and the use of the marginal propensity to consume for their calculation, however, the literature seems to have largely ignored these estimates.

through the general level of exports, export shares with other countries, and the respective GDPs of these countries. The following discussion of the data sources quantifies these trade linkages and highlights the importance of trade for small countries during the interwar period. It also highlights the significant variation in trade shares across the three most significant economies during this period. In turn, this variation motivates the construction of the foreign demand measure, which is used as an instrumental variable in the 2SLS regression framework. After discussing the role of tariff rates, a placebo approach is presented to demonstrate the robustness of the estimation results. Finally, a simple accounting framework is presented to assess the magnitude of the effect of trade destruction on national incomes.

2.1. Fixing Ideas

As for fiscal multipliers, we could, in principle, calculate the multiplier based on the marginal propensity to consume and import.[19] However, estimates for the marginal propensity differ so greatly even for modern data that they hardly present a satisfying basis for the calculation of multipliers.[20] Alternatively, we can think of the trade multiplier and foreign demand in terms of the framework outlined by Abeysinghe and Forbes (2005) in connection with the Asian crisis.[21] In their setup, country i in an n-country world has the following output:

$$Y = X + A \tag{2.1}$$

in which the subscript i is omitted, Y is the output, X denotes export component of output, and A the non-export component of output. We can rewrite X as the sum of i's exports X_j to j countries (with $j \neq i$ throughout the following equations):

$$Y = \sum_{j=1}^{n} X_j + A \tag{2.2}$$

expressing the above equation in growth rates yields:

$$\frac{dY}{Y} = \frac{1}{Y}\Big[\sum_{j=1}^{n} dX_j + dA\Big] \tag{2.3}$$

[19] Specifically, $m_x = \frac{1}{(1-mpc)+mpm}$.

[20] For example, Sahm et al. (2010) estimate it to be .3 based on survey data for the United States, whereas a clean quasi-natural experiment in Singapore suggests .8 (Agarwal and Qian, 2014). However, the variation in the estimates is not limited to methodologies or countries. As Shapiro and Slemrod (2003, p. 394) point out, it is very likely that the marginal propensity to consume is "contingent on aggregate conditions in ways that are difficult to anticipate."

[21] The equations presented follow their study closely but constitute only a small part of their whole argument.

From this equation, we could, in principle, estimate the elasticity of income with respect to changes in aggregate exports ($\sum_{j=1}^{n} dX_j$). However, Abeysinghe and Forbes (2005) further link the exports to each trading partner's economy in the following way. i's ability to export goods in the value of X_j to j depends on j's income such that:

$$X_j = X_j(Y_j) \tag{2.4}$$

with the derivative:

$$dX_j = \frac{\partial X_j}{\partial Y_j} dY_j \tag{2.5}$$

summing over all trading partners and expressing changes in terms of GDP as in 2.3:

$$\frac{dX}{Y} = \frac{1}{Y} \sum_{j=1}^{n} \frac{\partial X_j}{\partial Y_j} dY_j \tag{2.6}$$

and this can be rewritten as:

$$\frac{dX}{Y} = \frac{1}{Y} \sum_{j=1}^{n} \frac{\partial X_j}{\partial Y_j} dY_j \frac{X_j}{X_j} \frac{Y_j}{Y_j} \frac{X}{X} \tag{2.7}$$

denoting the elasticity of i's exports to j with respect to j's income with $\eta_j = \frac{\partial X_j}{\partial Y_j} \frac{Y_j}{X_j}$ and inserting the above term into equation 2.3 yields:

$$\frac{dY}{Y} = \frac{X}{Y} \Big[\sum_{j=1}^{n} \eta_j \frac{X_j}{X} \frac{dY_j}{Y_j} \Big] + d\frac{A}{Y} \tag{2.8}$$

and then assuming that the elasticity η does not vary by trading partner, the equation becomes:

$$\frac{dY}{Y} = \frac{X}{Y} \eta \Big[\sum_{j=1}^{n} \frac{X_j}{X} \frac{dY_j}{Y_j} \Big] + d\frac{A}{Y} \tag{2.9}$$

This final equation provides the link between country i's economy with the rest of the world. While obviously an abstraction,[22] three insights stem from this equation. These motivate the empirical setup and hence guide the data collection. First, the term $\frac{X}{Y}$, the overall

[22] While the above equations ignore many relevant relationships and implicitly make theoretically indefensible exogeneity assumptions, they are still useful to organise the thoughts.

export to GDP ratio, is an important determinant of how much the export sector can influence the domestic economy. The second important insight is that the income elasticity η links exports with the domestic economy. Third, the term $\frac{X_j}{X}\frac{dY_j}{Y_j}$ illuminates that the influence of a certain export market j for i's GDP depends on its weight relative to i's other export markets ($\frac{X_j}{X}$) and the GDP growth in j. With this wish list of variables at hand, we can now turn to the data collection.

2.2. GDP, Exports, Prices, and Trade data

The estimation of an export multiplier requires data on GDP, exports, and prices for the sample of 23 small economies.[23] Furthermore, data on trade flows are essential for the construction of the measure of foreign demand. This section briefly discusses the sources for and construction of the corresponding variables.

While quarterly GDP data are mostly unavailable for this period, the economic activity indices from Albers (2018) provide a close-enough proxy. This is particularly true as they are scaled on the volatility and trend of the annual per capita GDP data.[24] To facilitate the interpretation as a multiplier, it is important to express the economic activity and export data in terms of GDP. I thus rebase the *real* economic activity indices to 1929 nominal GDP per capita data (see Appendix A for the country-specific sources) such that:[25]

$$GDP_t = \frac{EAC_t}{(\frac{\sum_{r=1929Q1}^{1929Q4} EAC_r}{4})} GDP_{1929} \tag{2.10}$$

GDP_t thus provides a quarterly measure of real national product per capita in 1929 prices. As is common for quarterly national accounts (see e.g. OECD, 2017), the quarterly values are expressed as annualised equivalents.

[23] The database is limited to the 28 countries for which data has been gathered in Albers (2018). The United States, Germany and United Kingdom are excluded as they are considered large economies. Furthermore, I exclude Japan and France being neither small enough countries nor large enough importers.

[24] In fact, Mitchell et al. (2012) conducting a similar study refer to such indices as high-frequency GDP estimates. Quarterly rather than monthly data is used to abstract from very short-term fluctuations. For the purpose of this study, employing the indices by Albers (2018) might be even preferable over actual national accounts. This database contains a version of the economic activity index that, unlike actual GDP data, excludes all trade data. The trend on which it is scaled should not be influenced much by trade data as trade balances over the medium term. In a robustness test, this allows me to ensure that the estimates are not driven by the fact that exports, in principle, enter the model on both sides of the equation. In principle, this is also true for all estimates of the fiscal multiplier known to this author. In these study, spending enters the equation as part of GDP as well as the variable of interest on the right-hand side.

[25] As the estimations in this paper will be made in per capita terms (such as in Barro and Redlick, 2011, for estimating fiscal multipliers), I convert all variables into per capita by dividing their value by the population estimates (see Albers (2018) for the corresponding sources). The annual population data is converted to monthly frequency by a spline interpolation. Given the steadiness of population growth, this is a quite reasonable procedure. To simplify the notation, I omit the per capita term in the rest of the study.

Correspondingly, I rebase the quarterly nominal exports per capita on their respective per capita annual total of 1929. Finally, equation 2.11 divides the resulting term by the price index P with the base year 1929. This yields real quarterly per capita exports in 1929 prices:[26]

$$XP_t^{real} = \frac{\frac{XP_t^{nominal}}{\frac{\sum_{r=1929Q1}^{1929Q4} XP_r^{nominal}}{4}} XP_{1929}^{nominal}}{P_t} \tag{2.11}$$

Unfortunately, the choice of the deflator P is not straightforward. Contemporary export price indices have severe limitations, especially regarding the weighting (see League of Nations, 1939, p. 67 for a discussion). This can have severe implications for the interpretation of the real series. If the export price index is based on very few agricultural commodities, the prices of which fell rapidly during this period, increasing real exports could signal a flourishing export business when in fact farmers sell their harvest in large quantities at dumping prices. As we are interested in the impact of the foreign demand shock on the domestic economy, a GDP deflator provides an alternative. It expresses the income gained from exports in terms of the average price basket of the economy. Finally, wholesale price indices provide a compromise between the export and GDP deflators as they typically contain a number of export and domestic goods (League of Nations, 1939, p. 67). Because of this feature and their availability at a quarterly frequency, they constitute the preferred deflator for this study. To ensure that the choice of the deflator does not have an undue influence on the results, the robustness of the results against using either of these deflators is tested (and confirmed).[27]

Having gathered real export and GDP data, we can assess the importance of exports relative to GDP. However, as we will identify the export multiplier from the variations in foreign demand based on trade flows, bilateral export data is needed. I derive these from the *Statistisches Handbuch der Weltwirtschaft* (Statistisches Reichsamt, 1936).[28] As all data were given in millions of national currencies, the flows were converted by the dollar exchange rate from

[26]The quarterly nominal export data is derived from the smoothed and seasonally-adjusted monthly export data from Albers (2018). The smoothing and seasonal adjustment procedure is the same as outlined in that paper. The high (quarterly) and low (annual) frequency export data are typically fully consistent. However, in some countries such as Chile the introduction of a new nominal currency requires conversion. To ensure full consistency, I take the 1929 annual export values from the sources described in Appendix A rather than deriving them by summing the quarterly data.

[27]Unlike for wholesale prices, neither export price indices (with one for Belgium being the exception) nor GDP deflators exist at a monthly or quarterly frequency for the countries in the sample. An alternative is to employ annual export price indices and convert them to quarterly frequency. Using a spline interpolation, I create quarterly price indices from the annual indices, base them to 1929 $= 1$, and convert the nominal to real per capita exports in 1929 prices. Appendix A reports all sources.

[28]For Bulgaria, there was no trade flow to the United States given in the source. I assume this flow to have been half of the export flow to the United Kingdom.

the Board of Governors of the Federal Reserve System (1943).[29] This provides me with cross sections for 1927 and 1933 with $23 * 3 = 69$ exports flows each. These data will be used for the creation of the foreign demand variable and the miniature gravity model to create the placebo study.

2.3. The Importance of Trade for Small Economies

While the Great War had taken its toll on the achievements of the first era of globalisation, the global degree of trade openness as measured by the trade (exports+imports) to income ratio during the 1920s was comparable to that of the Bretton-Woods period (Klasing and Milionis, 2014). However, when looking at the construction of the weights for such global measure, the large and relatively closed economy of the United States dominates. In contrast, the focus of this study is the export sector of small countries. Table 1 thus provides country-specific export and GDP data for them.

Indeed, for many smaller economies the exports to GDP ratio in 1927 alone surpassed 20 % as the column $\frac{X}{GDP}$ of Table 1 demonstrates. New Zealand, Denmark, Belgium, and the Netherlands even exported more than 30 % of their GDP. Prima facie, this provides us with an idea of how much of a role the loss of foreign demand could have played during the Depression. It also raises the question to which countries most of the goods were exported.

For the world as a whole, the top three importers, the United States, Germany, and the United Kingdom, absorbed around a third of the exports.[30] Because of the centre-periphery relationships, their share in the exports of the small economies in the sample was much larger for most countries (see column $\frac{X_{Top3}}{X_{Total}}$).[31] For example, the share of Chilean exports, typically mining and agricultural commodities, that went to the three economic powerhouses of the world amounted to 78 %. Combining this share with the data from the previous column means that around 16 % of Chile's GDP was exported to the three largest importers of the interwar period. Hence, many small countries were relatively open and their exports concentrated, making the conditions in the three large markets an important factor in a small country's GDP.

However, even across these three markets, exports were all but diversified. The following six columns show the relative share of each of the three main economic powers in the small

[29] For Estonia, a cross calculation with Germany was necessary based on the exchange rate given in Statistisches Reichsamt (1936). For Australia, New Zealand, and South Africa, the rate for the British Pound was used as these were pegged $1:1$. The dollar conversion is only important for the estimation of the gravity model.

[30] Specifically, the world import value in 1929 was 35,595 m US-Dollars (1929 value), of which m $\$4,339$ were consumed by the United States, m $\$5,407$ by the United Kingdom, and m $\$3,203$ by Germany. The fourth largest importer was France with m $ 2,282 (League of Nations, 1937, p. 214f).

[31] The division of Austria and Hungary obviously led to a reclassification of internal to foreign trade in the two countries. Yugoslavia traded mostly with Austria and Italy due to its geographic (and historical) proximity.

TABLE 1: EXPORT SHARES OF SMALL COUNTRIES

Country	$\frac{X}{GDP}$	$\frac{X_{Top3}}{X_{Total}}$	$\frac{X_{Germany}}{X_{Top3}}$		$\frac{X_{United\ Kingdom}}{X_{Top3}}$		$\frac{X_{United\ States}}{X_{Top3}}$	
			1927	1933	1927	1933	1927	1933
Australia	13	52	17	15	73	81	10	4
Austria	23	25	73	68	15	21	12	11
Belgium	43	37	45	37	30	44	24	19
Bulgaria	11	25	94	95	4	5	2	0
Canada	19	76	5	2	44	53	51	45
Chile	21	78	14	14	47	50	39	36
Czechoslovakia	28	37	66	61	21	14	14	25
Denmark	32	83	26	16	73	83	1	1
Estonia	23	62	48	34	50	59	2	7
Finland	24	62	26	15	66	71	9	14
Hungary	16	16	82	54	15	39	3	7
Italy	11	35	41	37	28	35	30	27
Mexico	13	84	12	10	9	28	79	62
Netherlands	31	52	47	50	46	40	7	11
New Zealand	32	85	3	1	91	91	6	8
Norway	17	53	24	29	56	47	20	24
Poland	11	45	71	46	27	50	2	4
Romania	10	25	76	40	24	59	1	1
South Africa	15	61	8	3	90	95	3	1
Spain	7	40	23	22	49	58	28	20
Sweden	18	56	30	37	50	22	20	42
Switzerland	20	45	43	48	34	31	23	20
Yugoslavia	13	13	84	75	10	14	6	10

Sources: Own calculations based on sources documented in A.

Note: All values are given in percentages. Column 1 is based on data for 1929. Column 2 on data for 1927.

country's export markets for 1927 and 1933.[32] Combining these shares with the data in the first two columns also allows us to get an idea of the relative importance of large countries for the smaller ones. For example, around 9 % of the South African GDP were exports to the United Kingdom. Denmark exported 26 % of its GDP to Germany and Great Britain. Mexico's economy, in turn, heavily depended on exports to the United States, which made up around 8.5 % of her GDP. In short, economic conditions in a larger economy absorbing a significant share of a small economy's exports could have severe effects on these countries.

[32]These shares are normalised by the X_{Top3} to improve the readability across rows.

Why was there such little diversification in terms of export markets? At first glance, history seems to have mattered for trade patterns as the cases of Canada, Australia, New Zealand, and South Africa suggest. They traded relatively intensively with their colonial metropole Great Britain. Likewise, the table suggests that geography mattered. For example, the American share in Mexico's export market is relatively large. The same holds true for the German share in Czechoslovakian exports. Estimating a gravity model in the later part of this section confirms these casual observations. History and geography determined the locus of the main export market during this period. Consistent with the gravity literature, export portfolios between 1927 and 1933 changed relatively little.

It is a consensus view that both the course and depth of the Depression varied substantially across the United States, Great Britain, and Germany.[33] Combining this insight with the patterns of export markets shown in this section suggests that the small open economies could have been affected to different degrees by the global Depression through the trade channel. This is in line with what the League of Nations (1931, p. 236) reported as early as 1931. The first summary on the "course and phases of the World Depression" suggested that the depth of the Depression for each individual country did, amongst other factors, heavily depend on the situation of its "chief customers." Moreover, the League's report stated that "countries selling largely to others which have been seriously affected have tended to suffer, while those whose customers have enjoyed favourable conditions have in general been able better to maintain their economic activity." It is worthwhile to formalise these observations by constructing the appropriate measure.

2.4. Constructing the Measure of Foreign Demand

Based on the trade share data in Table 1 and the economic activity estimates from Albers (2018), I build the following measure of foreign demand.

$$Y_{i,t}^{F} = \sum_{j=1}^{n=3} w_{i,1927}^{j} * Y_{t}^{j} \tag{2.12}$$

where Y_{i}^{F} is the foreign demand for the small open economy i in quarter t. Y_{t}^{j} is the quarterly GDP per capita index of j in quarter t. $j = 1, 2, 3$ are the United States, United Kingdom, and Germany. Finally, w is the export share of i in 1927 with trading partner j. The shares are normalised such that $\sum w_{i,1927}^{j} = 1$.

Figure 2 highlights the variation of this measure over time across countries. The solid line emulates a synthetic country that exports to each of the large countries to the same degree ($w_{i,1927}^{1} = w_{i,1927}^{2} = w_{i,1927}^{3} = \frac{1}{3}$). The other indices are based on the actual trade data

[33] See, for example, Eichengreen (1992); Romer (1993); Bernanke (1995). In recent own work, I document the extent of these differences with monthly GDP data (Albers, 2018).

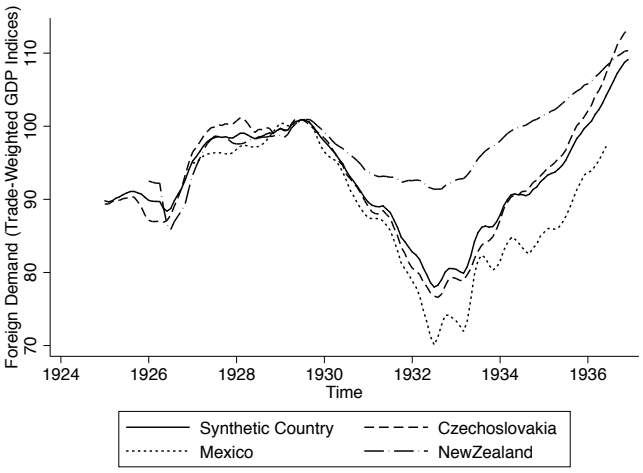


Figure 2: Varying exposure to foreign demand shocks due to composition of export markets

Source: Own calculations based on trade shares from Statistisches Reichsamt (1936) and the economic activity indices from Albers (2018).

in Table 1. It becomes apparent that the exposure to the Depression varied substantially across countries. Mexico traded mostly with the United States. As the Great Depression was the deepest in the United States among the three economic powerhouses, the drop in foreign demand for Mexico was very large. In contrast, New Zealand benefitted from the fact that Great Britain was its chief customer, absorbing exports worth about 24 % of her GDP. Foreign demand dropped relatively little because the Depression was least severe in Great Britain among the three main global importers. Finally, Czechoslovakia exported foremost to Germany. The German Depression was neither as deep as the one in the United States nor as mild as the one in Great Britain. This meant that the intensity of the foreign demand shock was milder than in Mexico, but more pronounced than in New Zealand. Figure 2 suggests that the variation in foreign demand for each of the small countries was indeed large. It stems solely from the historical and geographic trade patterns as the GDP data used for all three large countries is the same for every small economy. How did this variation in foreign demand affect export opportunities?

Figure 3 shows the conditional correlation between the growth of foreign demand and real exports.[34] The relationship is significant in statistical and economic terms. A 1 % percent change in the growth of the foreign demand index increased the growth of real exports by around 3.3 %. It is fair to assume that this variation is exogenous for the small country. First, it is unlikely that the small country influences the large country's economy to a significant degree. Second, the time fixed effect in the conditional correlation shown above controls for global economic conditions. The identifying variation comes from the combination of the

[34] The set of control variables includes (wholesale price) inflation, dummy variables for gold adherence and foreign exchange controls, and country and time fixed effects. The time fixed effect ensures that the identifying variation only comes from the variation in foreign demand at a given point in time.

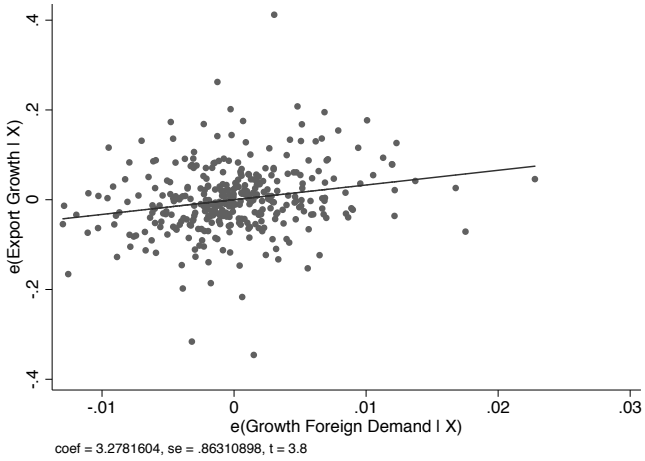


Figure 3: Relationship between exports and the foreign demand measure

Note: Conditional correlation of the growth of real exports with foreign demand as defined above. Controls include: inflation, gold adherence, foreign exchange controls, country fixed effects and year fixed effects. This graph is based on the balanced sample (1928Q3-1932Q1). Number of observations: 345.

course of the Depression in the three large countries and the trade patterns in 1927. These patterns themselves were deeply rooted in history and geography. They changed relatively little in response to the Depression. Given these desirable features, the relationship displayed here will thus constitute the first stage of the instrumental variable strategy chosen in this study.

2.5. Estimating the Trade Multiplier

For the estimation of fiscal multipliers, the literature has moved towards the analysis of time series data covering either one or multiple countries. Yet, the latter panel data approach cannot deal with the inherent identification problems either. Thus, the causal identification of the multiplier is either achieved by restrictions in a vector autoregression analysis or by instrumental variable approaches (see Ramey, 2011, for a concise and excellent review). In the following paragraphs, I present two specifications common in the fiscal multiplier literature but repurposed for the analysis of the trade multiplier. To the best of my knowledge, no other recent study adapts the instrumental variable approaches from the fiscal multiplier literature in this way.

The first specification follows the panel regressions by Almunia et al. (2010):

$$\frac{y_{i,t} - y_{i,t-1}}{y_{i,t-1}} = \beta_1 \frac{XP_{i,t} - XP_{i,t-1}}{XP_{i,t-1}} + \beta_x X' + c_i + t_t + \epsilon \tag{2.13}$$

in which $\frac{y_{i,t}-y_{i,t-1}}{y_{i,t-1}}$ denotes the GDP growth rate in country i, X' is a vector of controls, including inflation, a dummy capturing gold adherence and the imposition of foreign exchange

controls.[35] c_i denotes a country fixed effects country i. As the equation is estimated in growth rates, the country fixed effects account for structural reasons that might affect growth rates (e.g. industrial development). Finally, t_t is a time fixed effect for quarter t. This fixed effect captures global economic conditions.

The term $\frac{XP_{i,t}-XP_{i,t-1}}{XP_{i,t-1}}$ captures real export growth. Note, that in this setting the coefficient β_1 is not interpretable as a multiplier. Instead it is the elasticity of income with respect to changes in exports. In order to facilitate the interpretation as a multiplier, we have to divide the coefficient by the median ratio of exports to GDP in the sample ($m_x = \frac{\beta_1}{(\frac{X}{GDP})}$).[36] Because various dimension of endogeneity such as reverse causation and omitted variable bias loom large, estimating the above equation with the one stage OLS estimator is unlikely to produce reasonable estimates for the coefficient of interest.[37] This calls for an instrumental variable approach. As argued above, satisfying the exclusion restriction and relevance conditions, we can isolate exogenous changes in a small country's exports in this panel setting by the following first-stage regression:

$$\frac{XP_{i,t} - XP_{i,t-1}}{XP_{i,t-1}} = \beta_1 \frac{y^F_{i,t} - y^F_{i,t-1}}{y^F_{i,t-1}} + \beta_x X' + c_i + t_t + \epsilon_{i,t} \tag{2.14}$$

where $\frac{y^F_{i,t}-y^F_{i,t-1}}{y^F_{i,t-1}}$ captures the growth rate in foreign demand. This setup provides us with a causal estimate of the foreign trade multiplier. Note that the time fixed effect ensures that the identifying variation of the instrument comes from deviations in foreign demand based on the pre-crisis trade patterns, not the world demand itself.

In an alternative specification, I apply the approach put forward by Barro and Redlick (2011), estimating fiscal and tax multipliers for the United States. The advantage of this approach is that the coefficient can be interpreted as a multiplier without any further conversions. This is achieved by basing the changes in real exports on the GDP in $t-1$ such that the variable of interest becomes $\frac{XP_{i,t}-XP_{i,t-1}}{y_{i,t-1}}$:

$$\frac{y_{i,t} - y_{i,t-1}}{y_{i,t-1}} = \beta_1 \frac{XP_{i,t} - XP_{i,t-1}}{y_{i,t-1}} + \beta_x X' + c_i + t_t + \epsilon \tag{2.15}$$

[35] The gold standard adherence and foreign exchange control indicators are from a variety of sources (League of Nations, 1941; Wolf and Yousef, 2007; Bernanke and James, 1991; Crafts and Fearon, 2013). The wholesale price inflation is calculated from the data in Albers (2018). In robustness tests, I also add the lagged dependent variable $\frac{y_{i,t-1}-y_{i,t-2}}{y_{i,t-2}}$ to mitigate serial correlation concerns.

[36] This procedure is equivalent to the fiscal multiplier literature, where one divides the coefficient by the public spending to GDP ratio. Almunia et al. (2010) use the median, whereas Riera-Crichton et al. (2015, p. 19) use the mean. Using either does not make a large difference in the case of this study.

[37] One of such confounding factors could be the well-documented capital flow reversals during this period, which might affect exports and GDP (Accominotti and Eichengreen, 2016).

where the calculation of export growth in terms of GDP $\frac{XP_{i,t}-XP_{i,t-1}}{y_{i,t-1}}$ facilitates a straightforward interpretation of β_1 as a multiplier. Corresponding to the Almunia et al. specification above, the first stage is estimated by the following equation:

$$\frac{XP_{i,t} - XP_{i,t-1}}{y_{i,t-1}} = \beta_1 \frac{y^F_{i,t} - y^F_{i,t-1}}{y^F_{i,t-1}} + \beta_x X' + c_i + t_t + \epsilon \tag{2.16}$$

A potential problem for this setup is that the (lagged) left-hand side variable now features in the denominator on the right-hand side, which could induce endogeneity. Reassuringly, as we shall see, both specifications yield virtually the same result.

In this study, I focus on the size of the impact (contemporaneous) multiplier. Future research should also aim to estimate a more dynamic version of this multiplier, for example by using the local projection approach proposed by Jordà (2005). This approach has recently gained prominence in the fiscal multiplier literature (Ramey and Zubairy, 2018).[38] If dynamic effects are taken into account, the multiplier would most likely increase. Yet, other problems potentially emerge and thus this approach is not followed here.[39]

On the other hand, we might want to correct for trade-balance effects. So far, we have abstracted from the adjustment of the trade balance entirely. This may or may not be warranted in a short-run analysis such as this one even though a full adjustment of the trade balance is not a given during this period.[40] If there was no adjustment at all, we could just interpret the multiplier as it is. In a national accounting sense, however, trade is neutral. It is useful to distinguish contemporaneous ϕ and long-term adjustment (γ=1-ϕ) such that the trade balance-adjusted impact multiplier m_x^{TB} becomes:

$$m_x^{TB} = m_x - (1 - \phi) \tag{2.17}$$

If there is full within-period trade balance adjustment ($\phi = 1$), no adjustment of the trade multiplier is necessary and thus $m_x^{TB} = m_x$. This is because the growth in imports is already fully reflected in the contemporaneous GDP growth - the dependent variable in Equation 2.15. If there is zero contemporaneous adjustment of the trade balance ($\phi = 0$), the impact multiplier would become $m_x^{TB} = m_x - 1$. Fortunately, estimating (ϕ) is very straightforward. Another way to express ϕ is the within-period elasticity of imports M with respect to a change in exports, which can be estimated by the following equation:

$$\frac{M_{i,t} - M_{i,t-1}}{y_{i,t-1}} = \phi \frac{XP_{i,t} - XP_{i,t-1}}{y_{i,t-1}} + c_i + t_t + \epsilon \tag{2.18}$$

[38] Earlier estimates of the dynamic multiplier relied on VAR approaches in the vein of Ilzetzki et al. (2013).

[39] In particular, the large number of fixed effects essential for my identification strategy could impose problems. Typically, the panel local projections are not estimated with time fixed effects (see e.g. Jordá et al., 2017).

[40] See Appendix A for plots of the annual trade balance in terms of GDP for each country.

Using the same instrument for exports as in Equation 2.16, Appendix B.2 provides the corresponding estimate for the within-period adjustment $\phi \approx .53$. The conservative lower bound estimate for the foreign trade multiplier would thus be $m_x^{TB} = m_x - .47$, assuming full future trade balance adjustment and no impact of the multiplier other than the contemporaneous one. Another natural way to think of m_x^{TB} is the part of the multiplier that purely captures the gains from trade, many of which were lost during the period under consideration.

2.6. The Omission of Tariff Rates and the Measure of Foreign Demand

Even though the instrumental variable strategy should mitigate omitted variable bias and endogeneity concerns, some caveats of the measure of foreign demand are worth mentioning. So far, we have abstracted from changes in tariff barriers. If tariff barriers rose to the same degree in all three countries throughout the period, this would not pose any difficulties for the identification per se. As we know from previous research (Eichengreen and Irwin, 2010), this was not the case as the world crisis progressed in the 1930s. Germany became more restrictive than the United Kingdom and the United States in the 1930s. If the evolution of tariff barriers across the three large countries diverged, this could weaken the instrument as the weighting of the foreign GDPs is time-invariant.

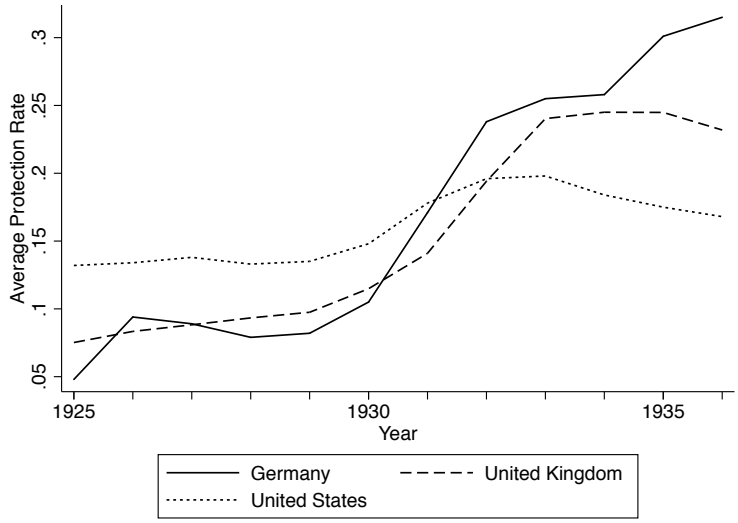


Figure 4: Average protection rates in Germany, the United Kingdom, and the United States

Source: Clemens and Williamson (2004); *Note:* Average protection rate: tariff revenue over imports.

However, Figure 4 demonstrates that the growth in protectionism across the three large countries only started to diverge significantly after 1932. Moreover, other forms of import restrictions such as quotas and exchange controls became more common in response to the financial crisis of 1931 and the collapse of the gold standard at the end of that year (Mitchener and Wandschneider, 2015; Gordon, 1941, p. 35f). Given these observations, we should

restrict the sample until 1932.[41] As for two countries of the countries in the sample, the GDP data are only available from 1928 onwards, a balanced subsample between the second quarter of 1928 and the first quarter of 1932 will thus serve as the preferred sample.[42]

2.7. A Placebo Test: Shutting Down History & Reversing Geography

The insight that trade flows are persistent in the short and medium term motivates the creation of the foreign demand instrumental variable. It also paves the way for a placebo test to verify the results of the analysis. As the observed pre-crisis trade shares are a function of history and geography, we can experiment with a historical and geographical counterfactual. Simulating the absence of (colonial) history and rotating the distance of countries to the main economic powers, what would the trade shares in 1927 have looked like? If we use these counterfactual trade shares to construct the foreign demand measure, do we still obtain significant results in the instrumental variable estimation? If so, this would cast doubts on the validity of the results.

To investigate this question, we start by creating a "miniature gravity model" including the exports of the 23 small countries in the sample to the three large importing nations. Specifically, I estimate the following equation:

$$XP_{i,j} = \beta_1 ln(D_{ij}) + \beta_2 C_{ij} + \gamma_i + \delta_j + \epsilon \tag{2.19}$$

$XP_{i,j}$ are the exports from the small economy i to the large economy j in US-Dollars, C_{ij} indicates if a colonial relationship exists, and γ_i and δ_j are exporter and importer fixed effects respectively. $D_{i,j}$ is the distance between small country i and large country j.[43]

Table 2 displays the results using the two most common estimators for this miniature gravity model. As OLS is biased when applied to trade data, the PPML estimator is preferred (Santos Silva and Tenreyro, 2006). The results are all but surprising. Countries farther apart traded less, but having a colonial tie had a positive effect on trade. The high value for the $Pseudo\ R^2$ indicates the power of geographical and historical forces in shaping commercial relationships.

With these elasticities at hand, we can now build our counterfactual world. The historical part of this world will be the absence of colonial ties by setting $\beta_2 = 0$. For the geographical counterfactual, I rotate the distances between trading partners.[44] The country that was farthest

[41] As the Import Duties Act became effective in March 1932 in the United Kingdom, the first quarter of 1932 seems a reasonable cut-off date within that year.

[42] Appendix C, however, demonstrates the robustness of the results for the full sample.

[43] Distances for the estimation of the gravity model were taken from Gowa and Hicks (2013).

[44] An alternative would be to randomise the distances entirely, but for the sake of the argument and precise replicability of the results, the rule-based rotation of countries is preferred.

TABLE 2: RESULTS FROM A MINIATURE GRAVITY MODEL

Estimator	OLS	PPML
Dep. Variable	LN(Exports)	Exports
LN(Distance)	-0.821***	-0.434***
	(0.183)	(0.115)
Colonial Tie	2.590***	2.424***
	(0.715)	(0.345)
Observations	69	69
R^2 / $Pseudo\ R^2$	0.856	0.908

Note: See text for data sources. A constant, importer and exporter fixed effects are included, but not shown. Standard errors in parentheses. $^{*}\ p < .10$, $^{**}\ p < .05$, $^{***}\ p < .01$.

away now becomes closest, the country that was second farthest now becomes the farthest away, and the closest country would now be in the middle of the two. Based on this reversed geography and the coefficients from Table 2, I then predict trade. This allows me to construct the relative trade shares in the three export markets akin to Table 1. Table A.24 in the appendix compares the actual and counterfactual trade shares in 1927. In turn, these counterfactual trade shares allow us to construct a "placebo" measure of foreign demand for each country. The calculation of this measure strictly follows the one for the actual foreign demand measure outlined in Section 2.4. It only differs in that it employs the counterfactual trade shares rather than the actual ones.

2.8. Accounting for the Importance of the Fall of Trade

The causal estimate of the export multiplier allows us to assess the role of trade destruction for the initial phase of the Great Depression in small open economies. Rather than using a metric such as the peak-to-trough loss, it is helpful to calculate the cumulative loss in the vein of Albers (2018). This measure has the salient feature of being comparable across countries by ensuring that the same time horizon is used across the sample. A further advantage is that an exceptionally good (or bad) quarter in terms of exports at the end of the three-year period has less influence on the result than a good (or bad) quarter at the trough when calculating the peak-to-trough loss. The cumulative loss relative to the peak is calculated by:

$$GDP_L = \frac{\sum_{t=1}^{12} GDP_{P+t} - GDP_P}{4} \Big/ GDP_P \tag{2.20}$$

where GDP_P is the quarterly GDP and P denotes the quarter, in which the final pre-Depression peak of the GDP occurred between 1928 and 1931. Dividing the integral between a horizontal line from the peak and the observed actual GDP for first three years (= 12 quarters) of the crisis by 4 and then by the peak-GDP allows us to express the initial loss in terms of annualised peak-GDPs. Correspondingly, the loss in real exports[45] in the first three years is calculated in the following way:

$$XP_L^{GDP} = \frac{\sum_{t=1}^{12} XP_{P+t} - XP_P}{4} \Bigg/ \frac{\sum_{t=1}^{P+12} GDP_{P+t}}{12} \tag{2.21}$$

in which, like above, P refers to the quarter in which GDP peaked. The term $\frac{\sum_{t=1}^{P+12} GDP_{P+t}}{12}$ ensures that the cumulative loss in exports ($\frac{\sum_{t=1}^{12} XP_{P+t} - XP_P}{4}$) is expressed in terms of the average GDP for the three years following the last GDP peak. We can then combine our estimate of the export multiplier m_x^{TB} with the cumulative loss in exports XP_L^{GDP} to calculate GDP_{TD} - the GDP loss that is due to the fall in exports (trade destruction).

$$GDP_{TD} = m_x^{TB}\ XP_L^{GDP} \tag{2.22}$$

Finally, dividing the trade-induced income destruction GDP_{TD} by the total decline GDP_L provides us with the share of total income loss caused by trade destruction:

$$S_{TD} = \frac{GDP_{TD}}{GDP_L} \tag{2.23}$$

As long as the terms XP_L^{GDP} and GDP_L are not positive (meaning a cumulative gain in either GDP or exports), S_{TD} must be greater than zero.[46] It can also be larger than one, implying that, in the absence of the loss in exports, the country's economy would have grown ceteris paribus.

[45] I use the GDP deflator for this accounting exercise as the interpolation from annual to quarterly observations, unlike for the regressions, seems to be harmless here. Given the objective of the accounting exercise, the effect of the loss of exports on the domestic economy, converting nominal exports to real exports employing the GDP deflator seems the most appropriate procedure.

[46] Only in the case of Bulgaria, exports do not fall cumulatively during the first three years of the crisis. Export quantities increased heavily due to two exceptionally good harvests in 1930 and 1931 (Methorst, 1938, p. 47). Bulgaria is thus omitted from this exercise. An interpretation would naturally be that in the absence of the gain in trade, the Depression would have been even worse.

3. Results

3.1. Estimating the trade multiplier

Table 3 reports the results of the IV estimation for the balanced sample of 23 countries running from the third quarter of 1928 until the first quarter of 1932. All regressions include a set of controls comprising wholesale price inflation, gold standard adherence, imposition of foreign exchange controls, country and time fixed effects. [47]

TABLE 3: IV RESULTS (BALANCED SAMPLE - 1928Q2–1932Q1)

Specification	Almunia et al.		Barro-Redlick		Placebo	
	1^{st} Stage	2^{nd} Stage	1^{st} Stage	2^{nd} Stage	1^{st} Stage	2^{nd} Stage
	x	y	x^{GDP}	y	x^{GDP}	y
x		0.19***				
		(0.05)				
x^{GDP}				1.20***		1.28
				(0.39)		(1.55)
y^F	3.36***		0.52***		1.45	
	(0.75)		(0.10)		(1.47)	
Observations	368	368	368	368	368	368
Countries	23	23	23	23	23	23
Partial F	20.22		26.37		0.98	

Note: * $p < .10$, ** $p < .05$, *** $p < .01$; Standard errors in parentheses and clustered at the country level. Controls included, but not shown: wholesale price inflation, gold standard adherence, imposition of foreign exchange controls, time and country fixed effects. The median ratio of exports to GDP for this sample is .161.

The first two columns show the specification in the vein of Almunia et al. (2010). The instrument is very strong as signalled by the partial F-statistic well above 10. To interpret the elasticity of income with respect to changes in exports, we have to divide the estimate for the export variable xp by the median ratio of exports to GDP such that the export multiplier is $m_x = \frac{.193}{.161} \approx 1.19$. This value is virtually the same as the estimate of the specification in the vein of Barro and Redlick (2011) shown in column four (1.20). In the case of the Barro and Redlick-specification, the coefficient for changes in xp^{GDP} can be interpreted without further

[47] For expositional clarity, their display is omitted in the below table. The respective coefficients are shown in Appendix C. Given that during this period almost all countries were still on the gold standard and foreign exchange controls were the exception rather than the rule before 1932, they are of little interest.

transformation. As for the Almunia et al.-specification, the partial F-statistic in the first stage suggests that the instrument is relevant and strong. Based on these estimates, we can conclude that the foreign trade multiplier m_x was about 1.2 in the period under consideration. This estimate is reassuringly close to another, though domestic, demand-shock based estimate of the multiplier during this period. Rather than analysing a foreign demand shock, Almunia et al. (2010, p. 247) use domestic defence spending shocks on government expenditure. Their (fiscal) multiplier takes a value of 1.6.

We can convert the estimated impact multiplier into the trade-balance adjusted multiplier by $m_x^{TB} = 1.2 - .47 \approx .73$. This provides us with the most conservative estimate for the foreign trade multiplier, assuming for full future readjustment of the trade balance and neglecting any potential dynamic effects. This effect is still large. For every percentage point of exports lost (in terms of GDP), GDP declined by .73 %. Again, m_x^{TB} corrects for all accounting-related effects and simply captures the lost gains from trade. As the next section will demonstrate, this multiplier is large enough to have severe implications for our understanding of the spread and depth of the Great Depression.

The results presented here are robust against a number of specifications. The last two columns of Table 3 estimate the Barro and Redlick-specification with the placebo foreign demand rather than the actual one. As expected, the first stage indicates that the counterfactual foreign demand is no predictor of the crisis. The second stage thus naturally leads, as it should do, to insignificant results. This non-result provides an important verification of the multiplier estimate. It shows that the finding is not driven by unobserved global movements.

Further robustness checks are included in Appendix C. The results change little when (i) errors are clustered along the country *and* time dimension and (ii) a lagged dependent variable is included to mitigate serial correlation concerns. While the instrument becomes weaker as the trend in the erection of trade barriers diverges in the mid-1930s, the results also hold (iii) for the full (unbalanced) sample throughout the period. In fact, the estimated trade multiplier grows. However, it is not clear whether this is due to a weak instrument problem or in fact driven by the nature of the recovery of the 1930s. In specification (iv), I estimate the same equation with the economic activity indices that were constructed without any trade and price data. Finally, specification (v) does employ un-smoothed data for exports and prices. Naturally, the estimate is less precise as the export data are very volatile for some countries. However, its econometric and economic significance is comparable to the other specifications and the F-statistic for the first stage remains close to the value of 10.

3.2. Accounting for the Importance of the Fall of Trade

How would the initial course of the Great Depression have looked like in small open economies in the absence of the breakdown of opportunities to export? Table 4 provides a guide to answer this question based on the GDP and export data for each country and the causal estimate of the export multiplier from the previous section. The countries are ordered

by the explanatory power of the trade channel.

TABLE 4: THE IMPACT OF TRADE DESTRUCTION ON INCOME

Country	GDP_L	XP_L^{GDP}	GDP^{TD}	$S_{TD} = \frac{GDP^{TD}}{GDP_L}$
Explanatory Power of the Trade Channel: > 100 %				
Belgium	-20	-42	-30	154
Estonia	-6	-12	-9	152
Denmark	-12	-18	-13	105
Explanatory Power of the Trade Channel: 50-99 %				
Norway	-9	-11	-8	90
Netherlands	-25	-29	-21	85
Czechoslovakia	-23	-26	-19	84
Hungary	-16	-16	-12	73
Switzerland	-16	-15	-11	71
South Africa	-19	-16	-12	62
Austria	-34	-28	-21	60
Finland	-10	-8	-6	57
Sweden	-25	-18	-13	52
Explanatory Power of the Trade Channel: < 50 %				
Yugoslavia	-26	-17	-13	48
Canada	-42	-26	-19	46
Chile	-64	-39	-28	44
Australia	-24	-14	-10	43
Italy	-16	-9	-6	38
Mexico	-18	-8	-6	34
Spain	-27	-11	-8	29
New Zealand	-39	-15	-11	28
Romania	-21	-7	-5	26
Poland	-32	-5	-4	12

Source: Own calculations. All numbers are given in percentages.

Note: All calculations based on a trade multiplier of 0.73.

The column GDP_L displays the cumulative GDP loss in the first three years after each country's pre-Depression peak. Correspondingly, the column XP_L^{GDP} shows the cumulative

loss in real exports over the average GDP in the first three years of crisis. For example, Belgium had lost 20 % worth of a year of its peak-GDP in the three years following the pre-Depression peak. During the same period, she had cumulatively lost 42 % of exports in terms of her average GDP during these three years. The column GDP_{TD} multiplies this latter value with the trade multiplier showing the percentage amount of GDP lost to trade destruction.[48] In the case of Belgium, this would imply a 30 % loss in terms GDP due to the loss of export markets, whereas the actual observed one was 20 % (column 1). Finally, the column $S_{TD} = \frac{GDP^{TD}}{GDP_L}$ divides the former by the latter, thus documenting the share that trade destruction can explain in the total GDP loss during the first three years of the crisis. In the Belgian case as well as for Estonia and Denmark, the trade channel over-explains the drop in GDP. Put differently and all other things equal, these economies would have grown in the absence of the fall in trade. This accessible metric thus allows us to gauge, to a first approximation, how important the loss of export markets could have been for the course of the Great Depression in small open economies.

The second group contains countries for which at least half of the initial downturn can be explained by the loss of export markets. The fact that much, if not all, of the initial depth of the Depression in the Scandinavian countries is explained by the loss in export opportunities, resonates well with the large effects of international fluctuations on the Scandinavian business cycles found in Klovland (1998, p. 335). Similarly, country-specific studies on Austria, Switzerland, Hungary, and Czechoslovakia have emphasised the lack of world demand as an important contributing, though not necessarily dominant, factor for the Depression.[49] The same holds true for the economies of the Netherlands and Belgium, which were particularly vulnerable due to their openness (see van Zanden (1998, p. 109) and Mommen (1994, p. 32).

The final group comprises countries for which the trade channel explains less than 50 % of the downturn. However, it is still a large factor for the depth of the initial crisis in countries such as Australia and Canada.[50] The results for Italy confirm the important role ascribed to the loss in foreign demand found in earlier research (Mattesini and Quintieri, 1997, p. 279). Except for Poland, a relatively closed economy (see Table 1), the trade channel can explain

[48] A potential caveat of this method is that the estimate of the multiplier is not country-specific. On the other hand, it is not ex-ante clear why the multiplier itself should vary greatly across countries. In any case, this accounting exercise rather than being a definitive statement in the sense of a horse race on the causes of the Great Depression in small open economies shall illuminate the relative importance of the trade multiplier.

[49] See Otruba (1968, p. 20) and März (1990, p. 413) for Austria, Woitek et al. (2012, p. 145) for Switzerland, Berend and Ránki (1985, p.61–64 with a special emphasis on agriculture) for Hungary, and Pryor et al. (1971, p. 46) for Czechoslovakia. This is of course not to say that other factors were negligible or that trade is framed as the dominant driver of the Great Depression in these countries. This is particularly true for the consequences of the *Creditanstalt* crisis in Austria (Schubert, 1991) and the twin banking crisis in Hungary (Macher, forthcoming).

[50] See Valentine (1987) on the role of the fall in exports and export prices in Australia and Horn (1984) on the role of the loss of foreign markets for the Canadian Depression.

substantial parts of the initial depth of the crisis even in this last group.

In sum, a number of countries would perhaps have avoided or nearly avoided the first years of Depression altogether had there not been such a drastic fall of export opportunities. For most other countries, the trade channel still serves as an important explanation for the initial depth of the crisis. The effects presented here are large, but they are not unrealistic. They are fully consistent with the notion of contemporaries that, besides the gold standard, the exposure to the global Depression determined the fate of the small open economies during the interwar years. Furthermore, they are consistent with the importance of trade linkages for business cycle comovement during this period.[51] After all, trade propagated the Depression to a significant extent.

4. Conclusion

This study resurrects the concept of the foreign trade multiplier for the analysis of short-run macroeconomic fluctuations. Ironically, while nowadays the foreign trade multiplier is at the centre of (mostly Keynesian) long-run development economics, explaining short-run fluctuations is precisely what Harrod's initial contribution was intended for. The trade multiplier can explain large parts of the Depression in the small countries, at least in the initial stages. Some countries would have even escaped this downturn altogether if it was not for the fall in trade. Or to morph Dennis H. Robertson's quip (Polak, 1956): If the industrial powerhouses of the world had not sneezed, the rest of the world could have avoided catching pneumonia. In reality, however, demand from the large importers for exports dropped. Given the magnitude of the crisis emanating from them, it seems unlikely that any small open economy could have escaped the Great Depression by implementing better policies.

On the empirical side, future work should aim to provide dynamic estimates of the multiplier. Furthermore, it should quantify the impact of the rise of tariffs on the destruction of income in a more formal manner. Finally, it would be interesting to investigate the relative importance of prices and demand. One could argue that for some countries the increasing real exchange rate relative to that of other exporters who had left the gold standard was the dominant force for the fall in trade during the later phase of the Depression. If so, the gold standard naturally plays a role. However, the mechanism is quite different from the ones operating through the real wage (Bernanke and Carey, 1996), domestic financial (Bernanke and James, 1991), and international financial channel (Temin, 1993; Accominotti, 2012; Accominotti and Eichengreen, 2016). In this study, I have avoided this question by dealing only with the first phase of the Depression. Most countries in the sample were still on the gold standard during this episode.

These empirical questions aside, the economic policy implications are perhaps the most thought-provoking ones. The magnitude of the effects presented in this study calls into ques-

[51] See Mathy and Meissner (2011).

tion the idea that policymakers in small open economies had much leverage to counter the crisis. Much of their countries' fate seems to have depended on the course of the Depression elsewhere. While these countries could rely on currency devaluation or active fiscal policies in order to boost aggregate demand, there was a limit to the efficacy of these policies in the initial stages of the Depression. A large share of the fall in demand faced by small countries in the early 1930s was just a mechanical consequence of the economic recession in the world's core economies and, thus, was beyond their control. These findings also suggest that countries with a more diversified export portfolio are less likely to be hit severely by Great Depression-type events.

Appendices

A. Data

The following appendix summarises the data used in this study and sources thereof. Annual export, nominal GDP, real GDP, and export prices have been gathered from a variety of sources as detailed in the following appendix. Beyond these "source tables," it provides graphs for the exports to GDP ratios and the trade balance in terms of GDP for each country as referred to in the main text.

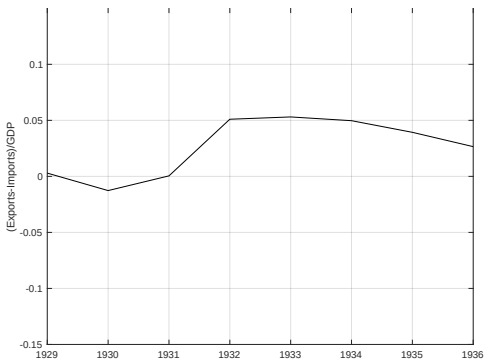
Furthermore, it contains figures showing the raw, seasonally-adjusted, and seasonally-adjusted and smoothed monthly export data. These data are shown to underscore the importance of seasonal adjustment and smoothing. Upon inspection of the individual country graphs, it becomes apparent that in some countries, exports exhibit very strong seasonal variations. Not correcting for those would introduce so much noise in the estimations that any attempt to estimate them would be fruitless. As in Albers (2018), the X-13-ARIMA algorithm is used to remove the seasonal components from the series. The graphs also suggest that even seasonally-adjusted data in some cases shows very large month-to-month variation due to a large irregular component. These could be, for example, due to a frozen harbour, dock strikes or measurement error. Typically, in the following month such changes are fully compensated as the export goods are stored and then simply accounted for the next month. In the case of the smoothed data, the MCD smoother is applied as in Albers (2018). In the specifications shown in this study, the smoothed data are thus used in the the preferred specification. While using the seasonally-adjusted data introduces more noise into the estimation and weakens the instrument, it does not affect the results in significant manner.

A.1. Data Australia

TABLE A.1: DATA SOURCES: AUSTRALIA

Variable	Unit	Source	Note
Real GDP	2010 Australian Dollars	Hutchinson and Ploeckl (2016)	GDP
Nominal GDP	Australian Dollars	Hutchinson and Ploeckl (2016)	GDP
Nominal Exports	Current Dollars	Butlin et al. (2014, p. 573)	Data was converted into calendar years.
Nominal Imports	Current Dollars	Butlin et al. (2014, p. 573)	Data was converted into calendar years.
Export Price Deflator	Index $(1966 = 1)$	Butlin (1977, p. 82)	Index was converted into calendar years.

(a) Export-GDP Ratio



(b) Trade Balance-GDP Ratio

Figure A.1: Trade Ratios - Australia

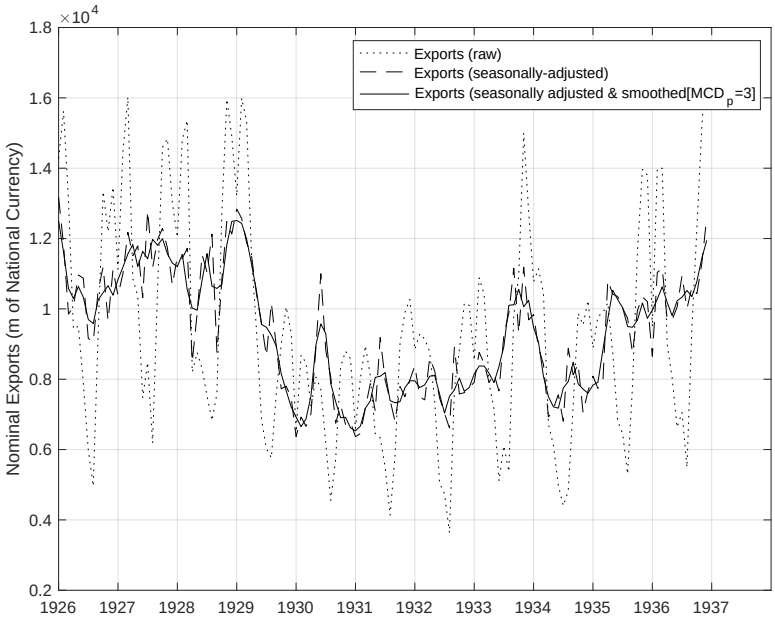


Figure A.2: Monthly Export Data - Australia

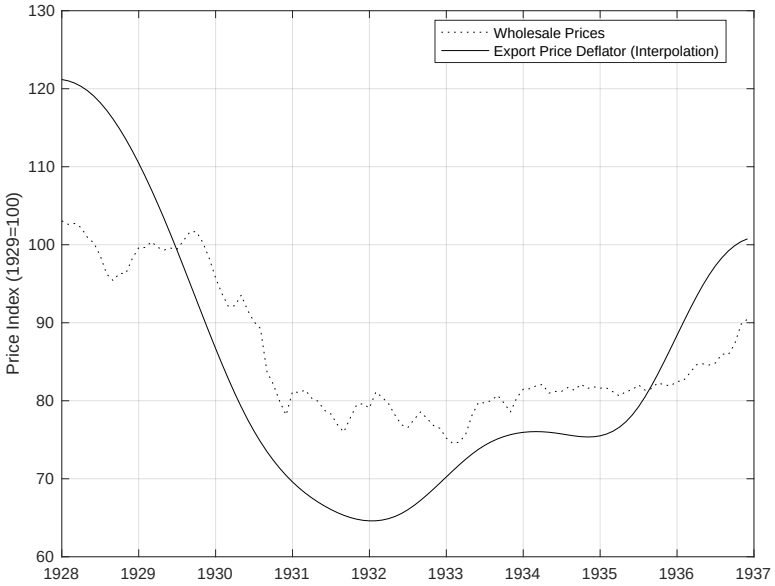
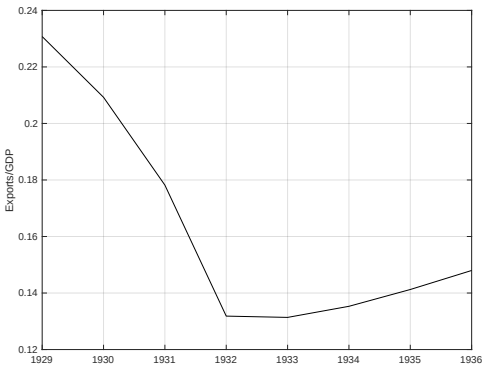


Figure A.3: Price Indices Data - Australia

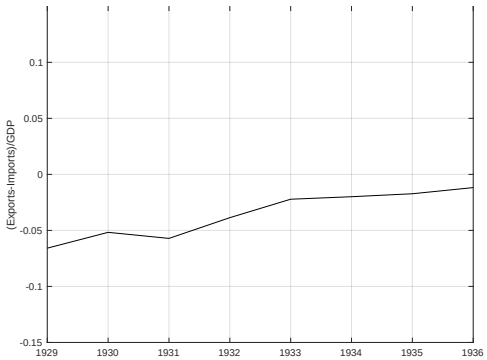
A.2. Data Austria

TABLE A.2: DATA SOURCES: AUSTRIA

Variable	Unit	Source	Note
Real GDP	m 1937 Schilling	Kausel et al. (1965, p. 42)	GNP
Nominal GDP	m Schilling	Kausel et al. (1965, p. 41)	GNP
Nominal Exports	m Schilling	Kausel et al. (1965, p. 41)	
Nominal Imports	m Schilling	Kausel et al. (1965, p. 41)	
Export Price Deflator	Index (1929=100)	Kausel et al. (1965, p. 40 & 41)	Implicit deflator based on nominal and real exports.



(a) Export-GDP Ratio



(b) Trade Balance-GDP Ratio

Figure A.4: Trade Ratios - Austria

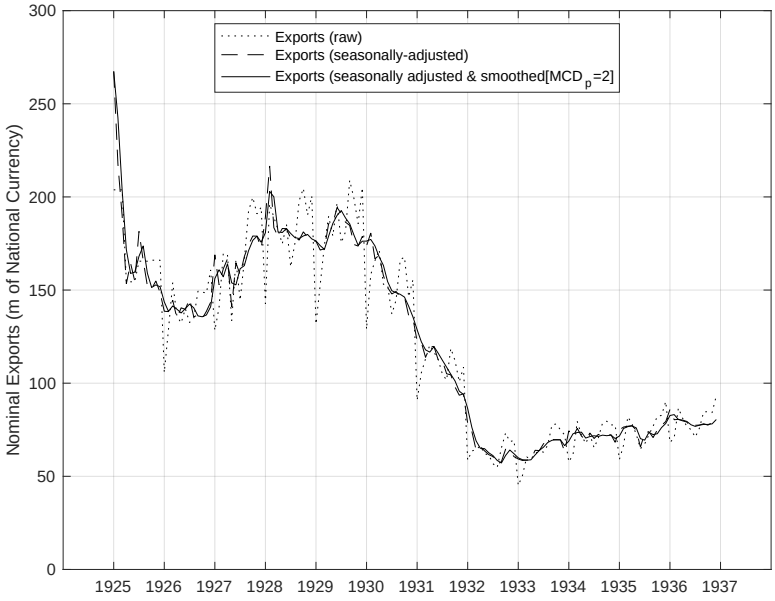


Figure A.5: Monthly Export Data - Austria

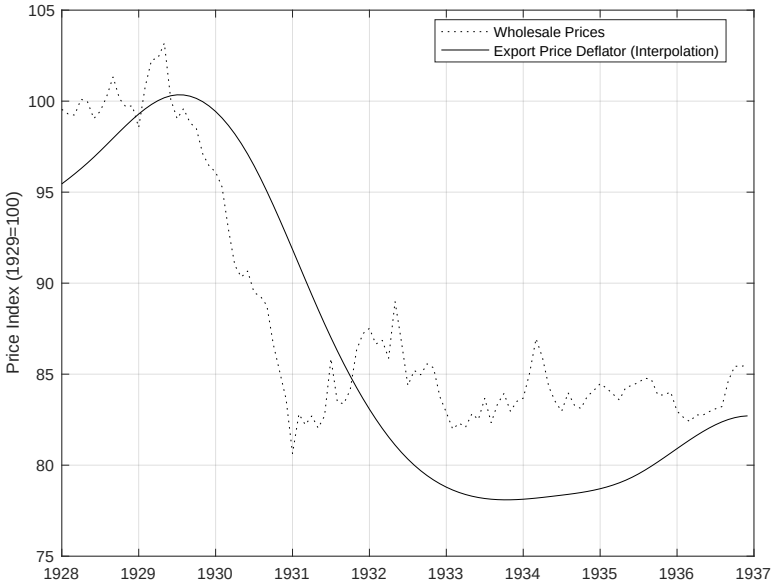
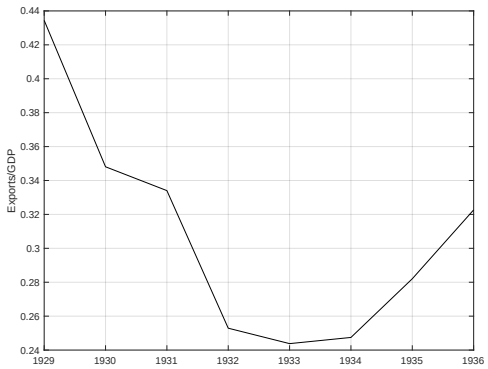


Figure A.6: Price Indices Data - Austria

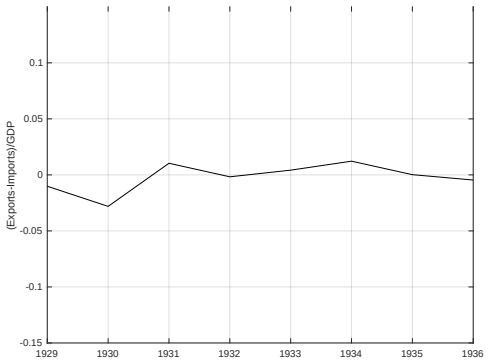
A.3. Data Belgium

TABLE A.3: DATA SOURCES: BELGIUM

Variable	Unit	Source	Note
Real GDP	1936-8 m Belgian Franc	Buyst (1997)	
Nominal GDP	Belgian Franc	Buyst (1997)	
Nominal Exports	Belgian Franc	Buyst (1997)	
Nominal Imports	Belgian Franc	Buyst (1997)	
Export Price Deflator	Index (1929 = 1)	Buyst (1997)	Implicit export deflator based on the estimates by Buyst (1997).



(a) Export-GDP Ratio



(b) Trade Balance-GDP Ratio

Figure A.7: Trade Ratios - Belgium

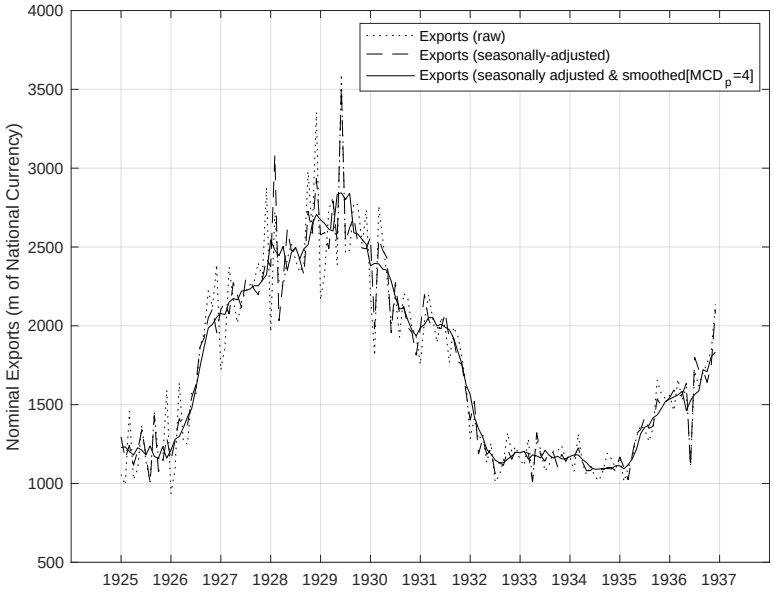


Figure A.8: Monthly Export Data - Belgium

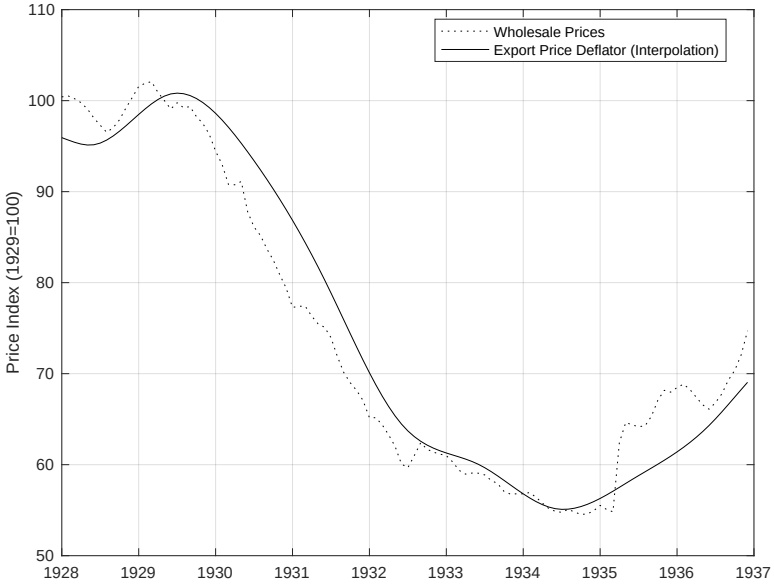
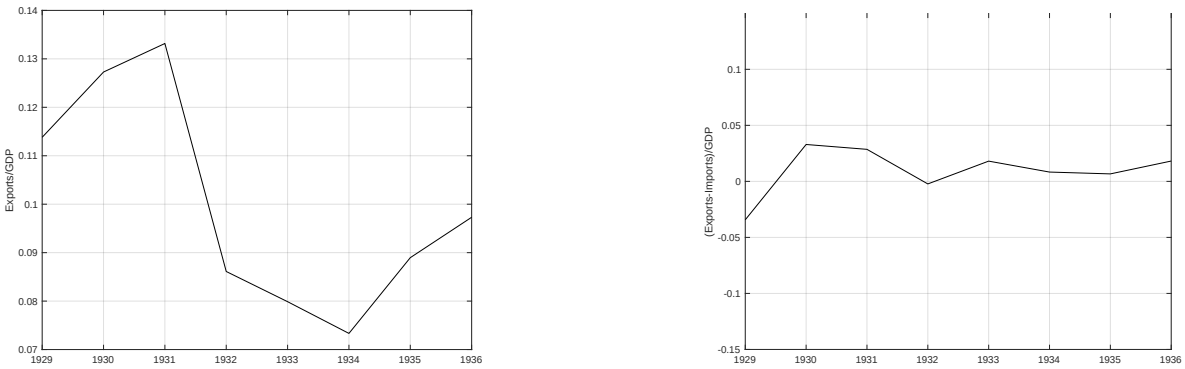


Figure A.9: Price Indices Data - Belgium

A.4. Data Bulgaria

TABLE A.4: DATA SOURCES: BULGARIA

Variable	Unit	Source	Note
Real GDP	m 1939 Lev	Bank of Greece et al. (2014)	
Nominal GDP	Current Lev	Bank of Greece et al. (2014)	
Nominal Exports	Current Lev	Bank of Greece et al. (2014)	
Nominal Imports	Current Lev	Bank of Greece et al. (2014)	
Export Price Deflator	Index (1939 = 100)		In the absence of a better alternative, I use the GDP deflator.



(a) Export-GDP Ratio

(b) Trade Balance-GDP Ratio

Figure A.10: Trade Ratios - Bulgaria

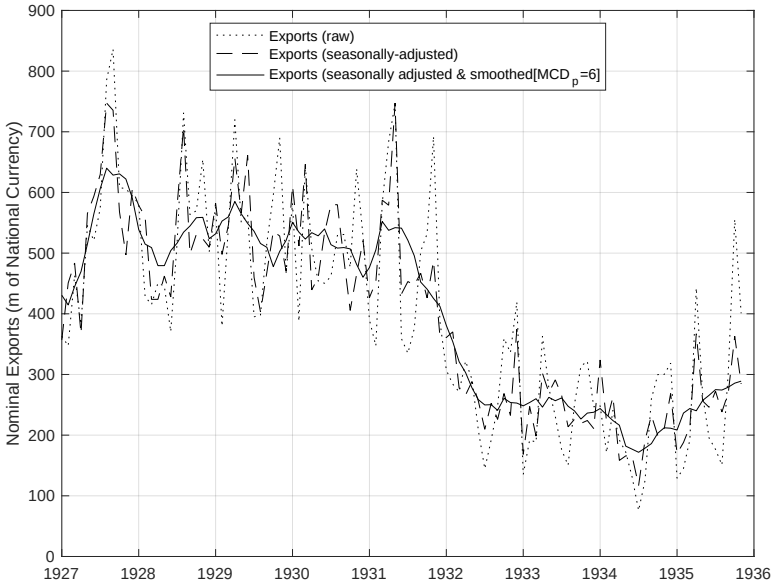


Figure A.11: Monthly Export Data - Bulgaria

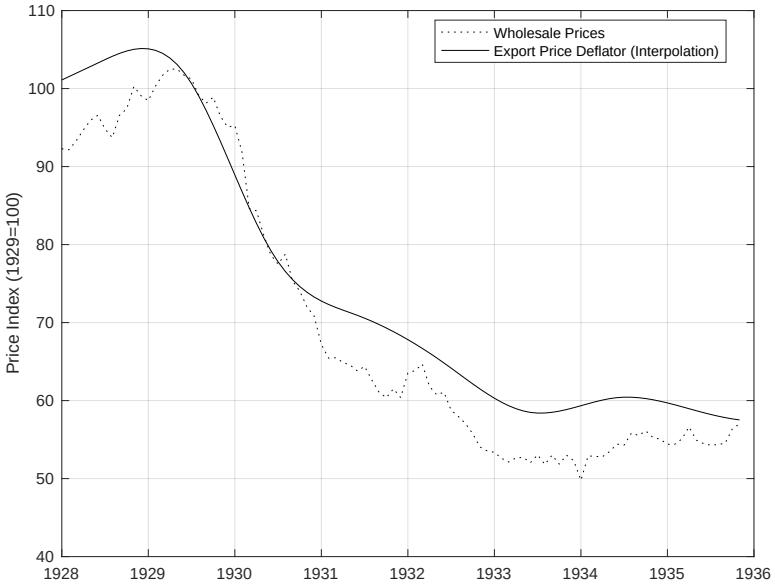
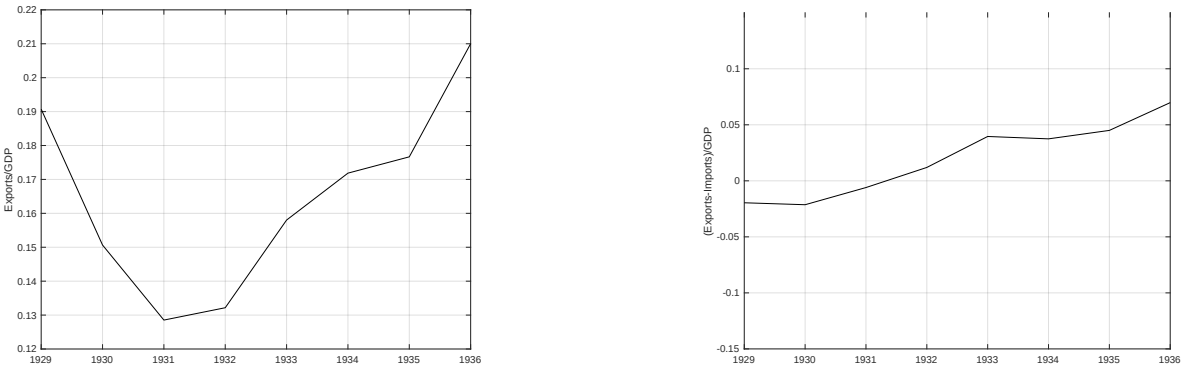


Figure A.12: Price Indices Data - Bulgaria

A.5. Data Canada

TABLE A.5: DATA SOURCES: CANADA

Variable	Unit	Source	Note
Real GDP	1971 Dollars	Mitchell (2003, p. 763)	GNP: I calculate the growth rate of the GNP series in 1920 prices to project the GNP of 1925 backwards.
Nominal GDP	m Dollars	Dincecco and Prado (2013)	GDP at factor cost
Nominal Exports	m Dollars	Mitchell (2014)	
Nominal Imports	m Dollars	Mitchell (2014)	
Export Price Deflator	Index (1929=100)	Statistics Canada (1983(2016, p. K31),League of Nations (1939)	I splice the series by League of Nations (1939) into the export deflator by Statistics Canada (1983(2016, p. K172-183) for before 1927.



(a) Export-GDP Ratio

(b) Trade Balance-GDP Ratio

Figure A.13: Trade Ratios - Canada

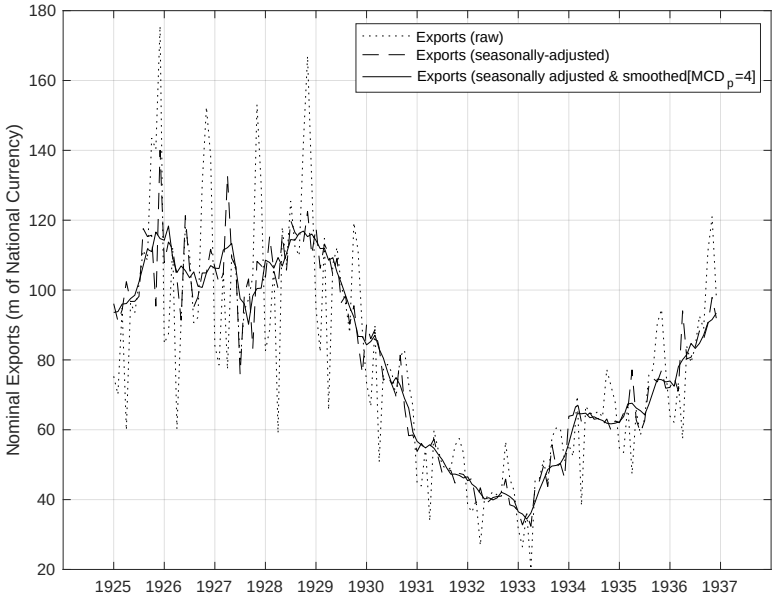


Figure A.14: Monthly Export Data - Canada

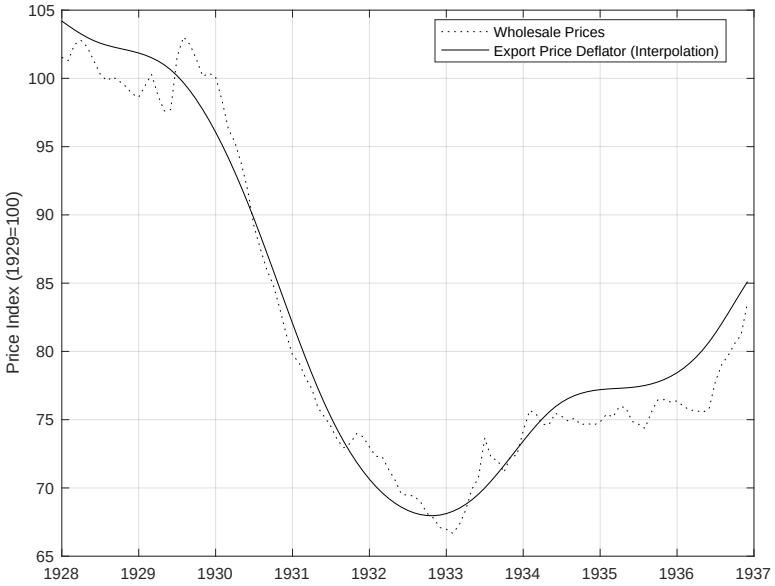
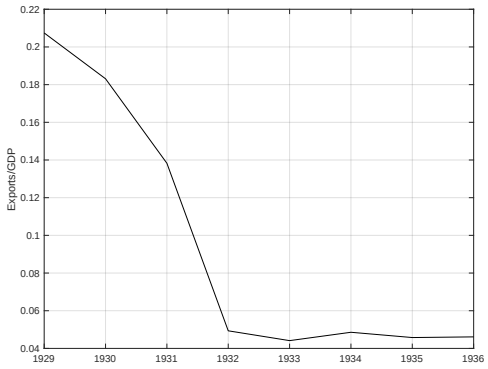


Figure A.15: Price Indices Data - Canada

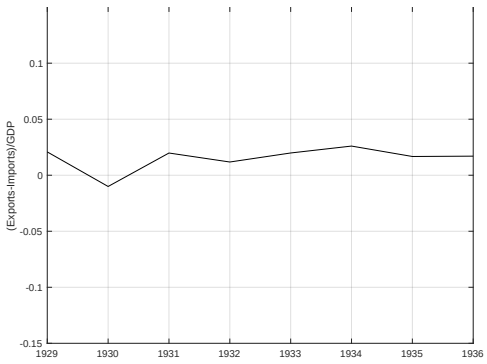
A.6. Data Chile

TABLE A.6: DATA SOURCES: CHILE

Variable	Unit	Source	Note
Real GDP	m 2003 pesos	Díaz et al. (2016)	
Nominal GDP	m new pesos	Díaz et al. (2016)	
Nominal Exports	m new pesos	Statistisches Reichsamt (1936), League of Nations (1939)	As exports are only available from 1927 until 1933. I use the value index by the League of Nations (1939) to calculate the nominal exports for the rest of the years. I convert the values to new pesos by dividing them 10^6 in order to be consistent with the GDP data, which is in new pesos.
Nominal Imports	m new pesos	Statistisches Reichsamt (1936), League of Nations (1939)	As imports are only available from 1927 until 1933. I use the value index by the League of Nations (1939) to calculate the nominal imports for the rest of the years. I convert the values to new pesos by dividing them 10^6 in order to be consistent with the GDP data, which is in new pesos.
Export Price Deflator	Index (2003 = 100)	Díaz et al. (2016)	



(a) Export-GDP Ratio



(b) Trade Balance-GDP Ratio

Figure A.16: Trade Ratios - Chile

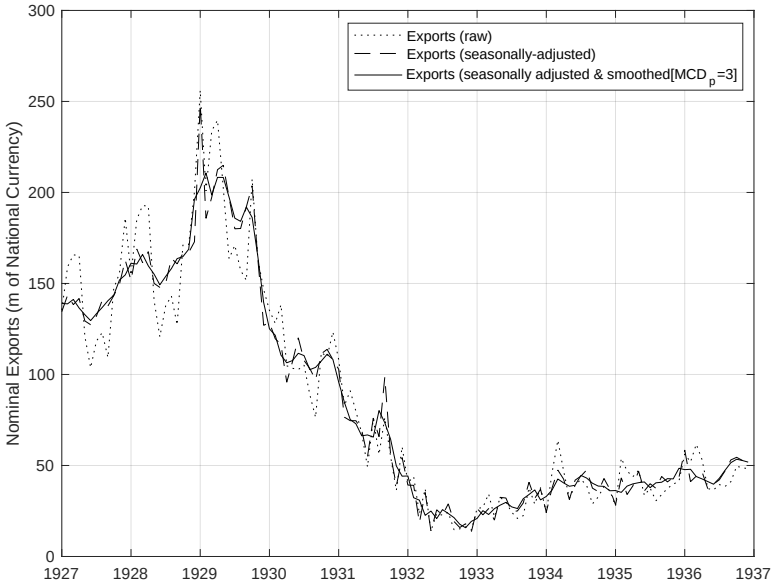


Figure A.17: Monthly Export Data - Chile

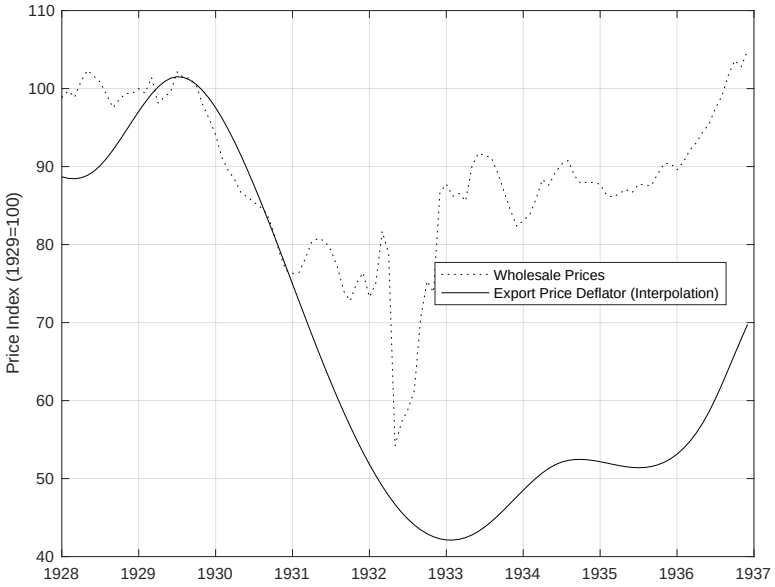
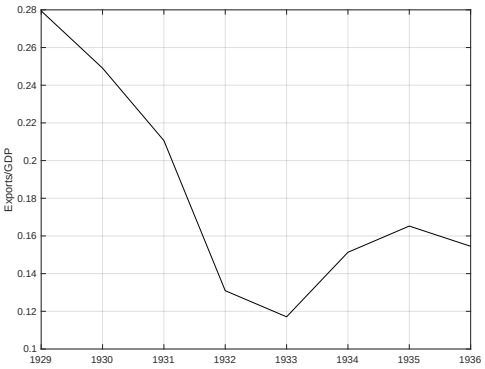


Figure A.18: Price Indices Data - Chile

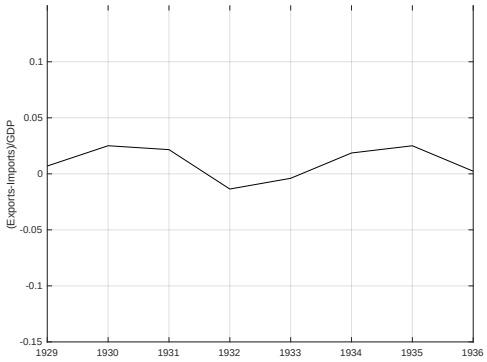
A.7. *Data Czechoslovakia*

TABLE A.7: DATA SOURCES: CZECHOSLOVAKIA

Variable	Unit	Source	Note
Real GDP	m 1929 Czech Crowns	Pryor et al. (1971, p. 47)	
Nominal GDP	m Crowns	Pryor et al. (1971, p. 47), Klasing and Milionis (2014)	I employ the 1929 benchmark estimate from Pryor et al. (1971) and use the growth rates from the nominal GDP estimates by Klasing and Milionis (2014).
Nominal Exports	m Crowns	Mitchell (2014)	
Nominal Imports	m Crowns	Mitchell (2014)	
Export Price Deflator	Indewx (1929 = 100)	Mitchell (2014),Pryor et al. (1971, p. 49)	I build the implicit deflator from the real and nominal export series.



(a) Export-GDP Ratio



(b) Trade Balance-GDP Ratio

Figure A.19: Trade Ratios - Czechoslovakia

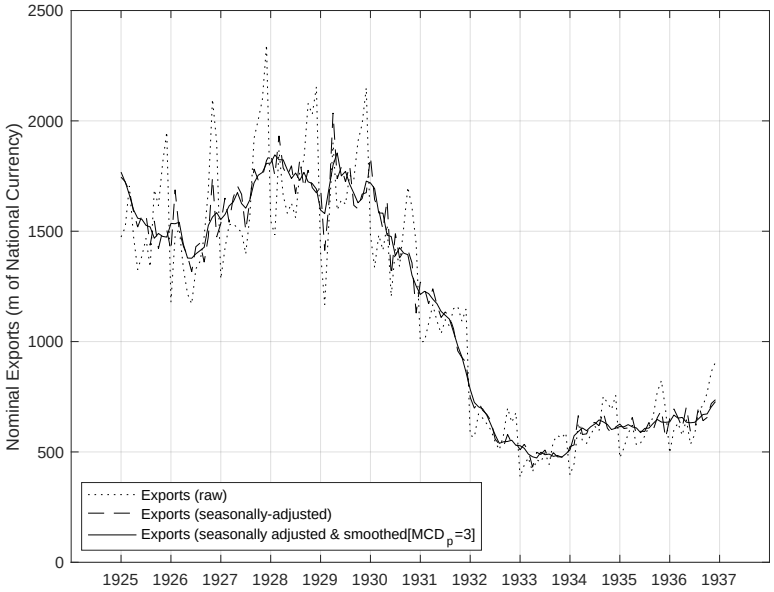


Figure A.20: Monthly Export Data - Czechoslovakia

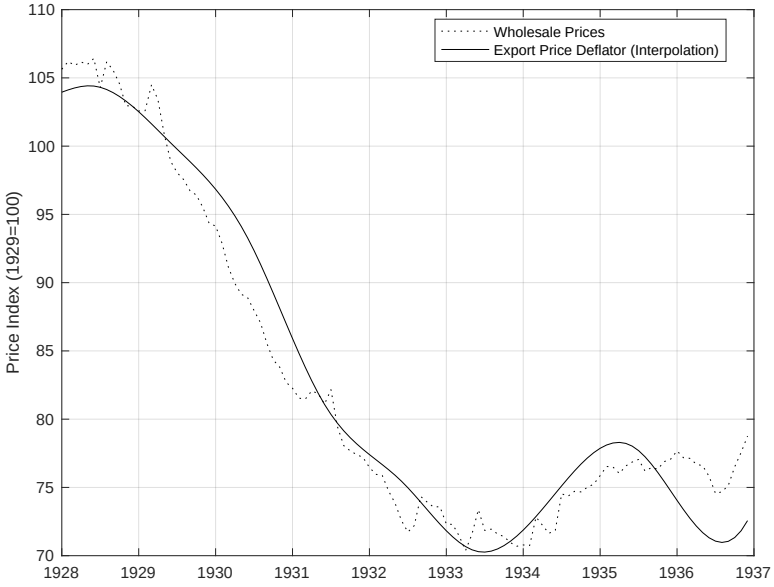
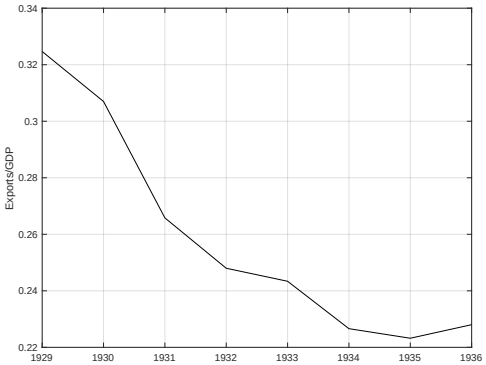


Figure A.21: Price Indices Data - Czechoslovakia

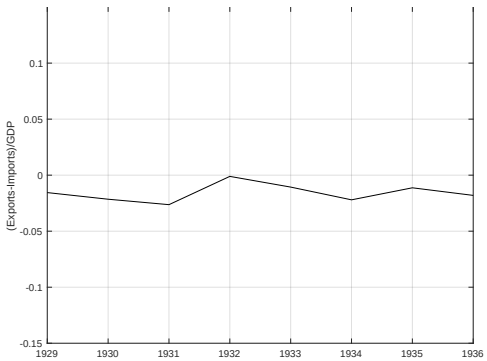
A.8. Data Denmark

TABLE A.8: DATA SOURCES: DENMARK

Variable	Unit	Source	Note
Real GDP	m 1929 Danish Crowns	Bjerke (1955)	From 1931 onwards, I splice in the official GDP series in constant 1935 dollars (Statistiske Departement, 1951). Bjerke noted that his deflation method would certainly underestimate the fall in output. Indeed the fall is more pronounced in the official series.
Nominal GDP	m Danish Crowns	Bjerke (1955)	
Nominal Exports	m Crowns	Bjerke (1955)	
Nominal Imports	m Crowns	Bjerke (1955)	
Export Price Deflator	Index (1929=100)	Statistiske Departement (1951)	In the absence of a better alternative, the export deflator is the GDP deflator as Bjerke (1955) did in his GDP calculations. The price index by the League of Nations (1939) seems flawed, suggesting increases in trade during the harshest Depression years. In contrast, the volume index of exports shown in Statistisches Reichsamt (1936) suggests a drop by about 30 percent.



(a) Export-GDP Ratio



(b) Trade Balance-GDP Ratio

Figure A.22: Trade Ratios - Denmark

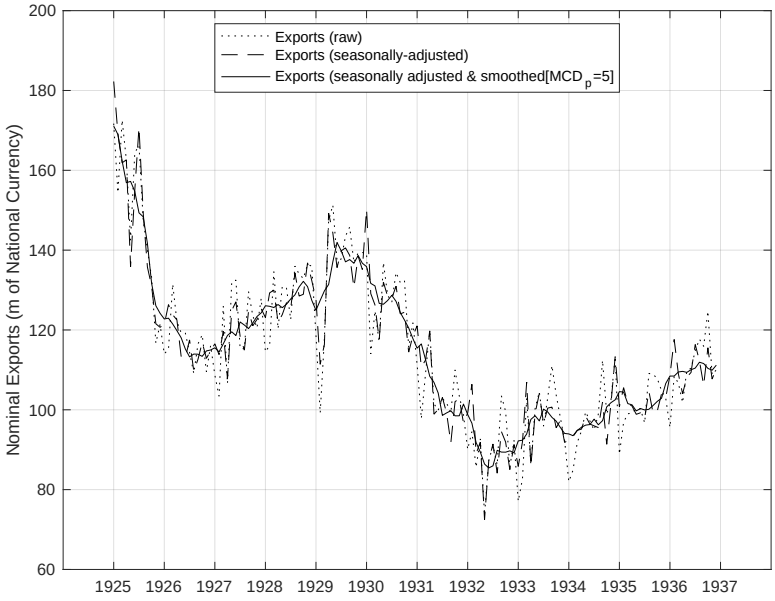


Figure A.23: Monthly Export Data - Denmark

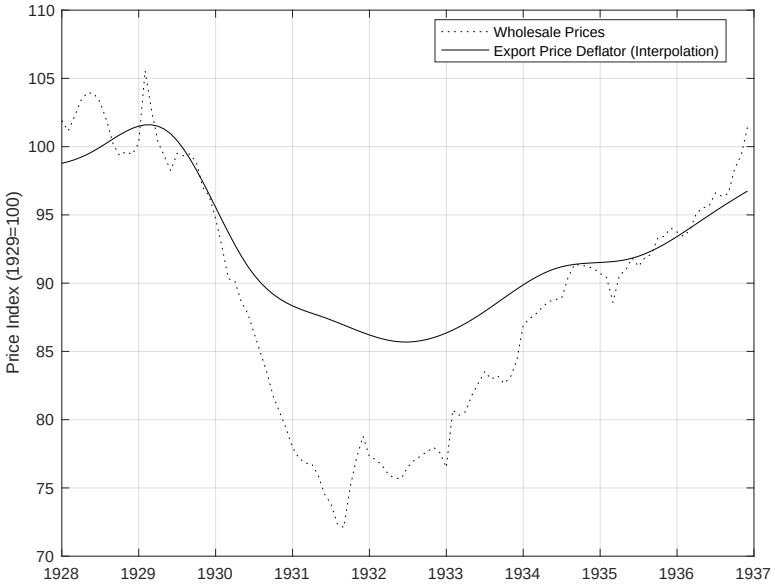
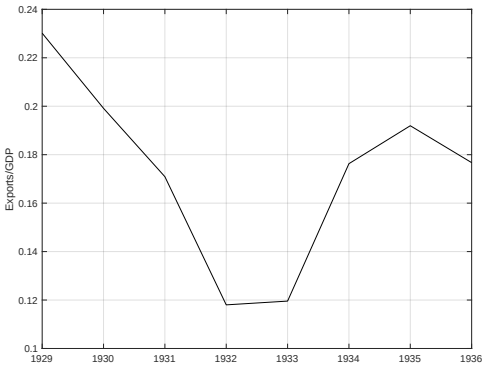


Figure A.24: Price Indices Data - Denmark

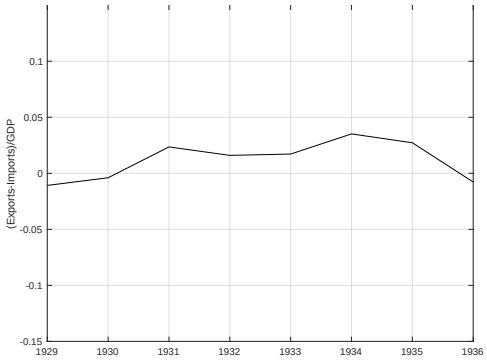
A.9. Data Estonia

TABLE A.9: DATA SOURCES: ESTONIA

Variable	Unit	Source	Note
Real GDP	m 1929 Estonian crowns	Valge (2003)	
Nominal GDP	m Estonian crowns	Valge (2003)	
Nominal Exports	m Crowns	Statistisches Reichsamt (1936, p. 75), League of Nations (1937, p. 218)	
Nominal Imports	m Crowns	Statistisches Reichsamt (1936, p. 75),League of Nations (1939)	
Export Price Deflator	Index (1929 = 100)	Valge (2003)[p. 74]	The index from the League of Nations (1939) seems flawed, which is why I use the GDP deflator.



(a) Export-GDP Ratio



(b) Trade Balance-GDP Ratio

Figure A.25: Trade Ratios - Estonia

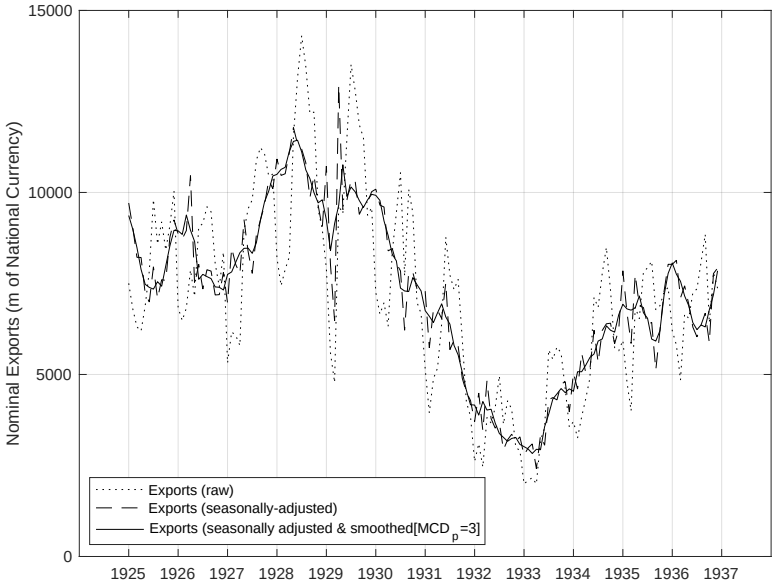


Figure A.26: Monthly Export Data - Estonia

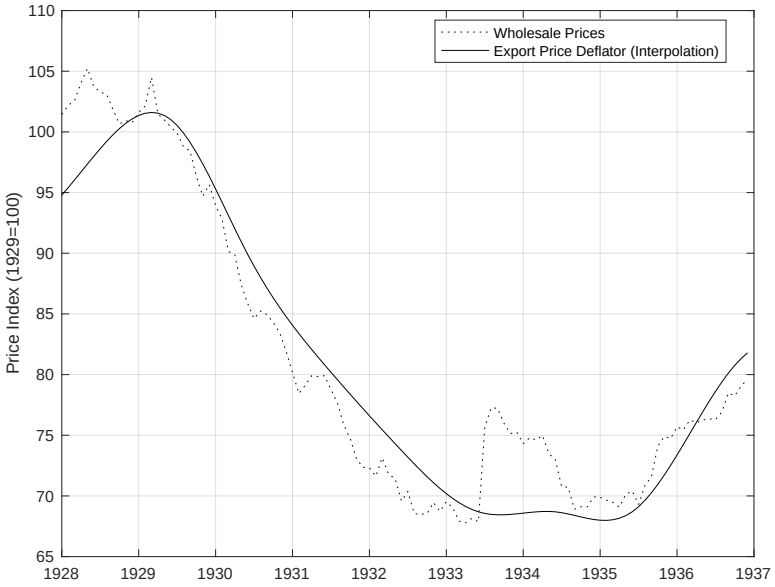
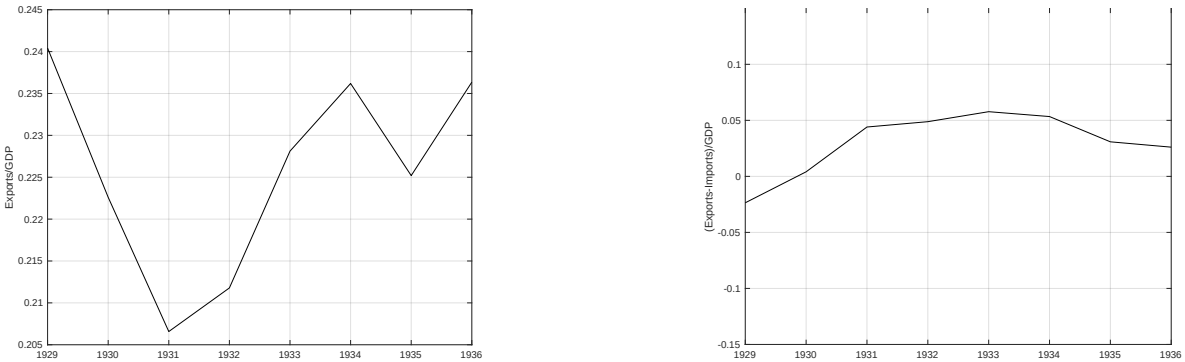


Figure A.27: Price Indices Data - Estonia

A.10. Data Finland

TABLE A.10: DATA SOURCES: FINLAND

Variable	Unit	Source	Note
Real GDP	1926 Prices in m Marka	Smits et al. (2009)	
Nominal GDP	m Finish Marka	Hjerppe (1989, p. 203)	
Nominal Exports	m Finish Marka	Hjerppe (1989, p. 260)	
Nominal Imports	m Finish Marka	Hjerppe (1989, p. 260)	
Export Price Deflator	Index (1927 = 100)	League of Nations (1939)	



(a) Export-GDP Ratio

(b) Trade Balance-GDP Ratio

Figure A.28: Trade Ratios - Finland

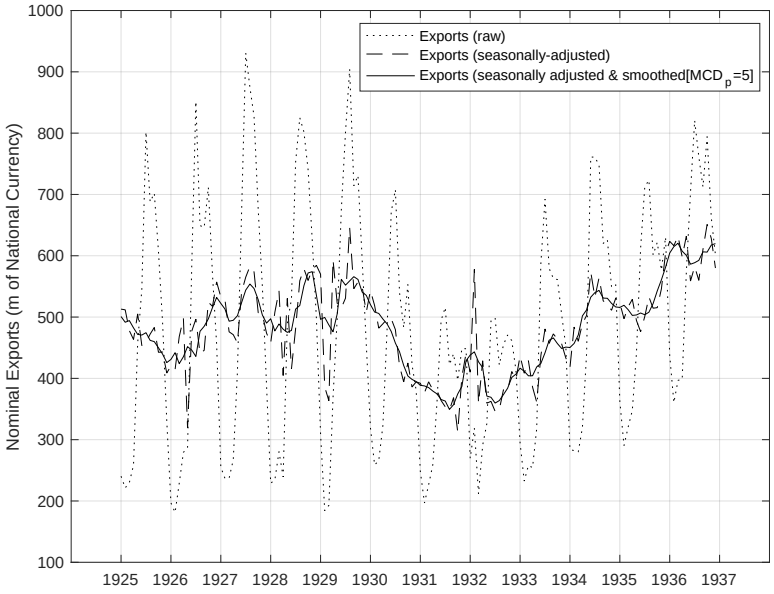


Figure A.29: Monthly Export Data - Finland

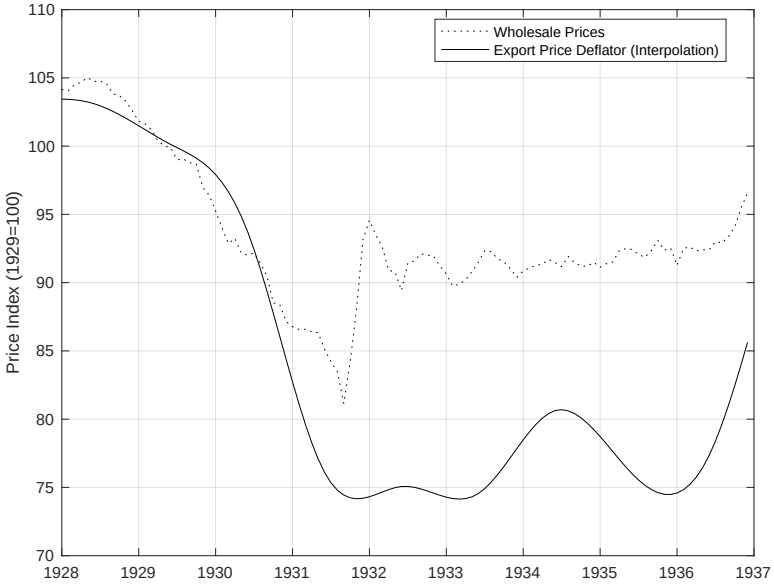
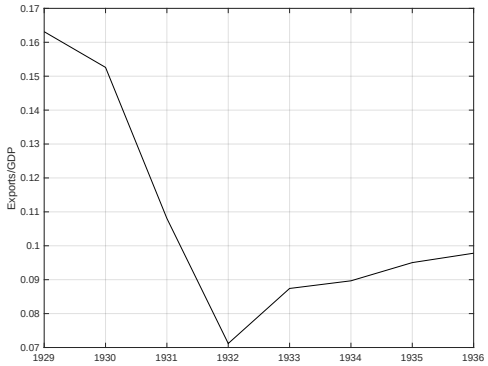


Figure A.30: Price Indices Data - Finland

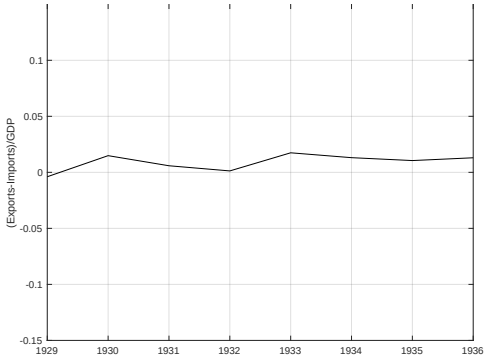
A.11. Data Hungary

TABLE A.11: DATA SOURCES: HUNGARY

Variable	Unit	Source	Note
Real GDP	1938/1939 Pengös	Eckstein (1955)	NNP: Compounding interpolation for 1921-1923. Data had to be adjusted from fiscal years to calendar years.
Nominal GDP	m Pengös	Eckstein (1955)	NNP: Compounding interpolation for 1921-1923. Data had to be adjusted from fiscal years to calendar years.
Nominal Exports	m Pengös	Mitchell (2014)	
Nominal Imports	m Pengös	Mitchell (2014)	
Export Price Deflator	Index (1927 = 100)	League of Nations (1939)	



(a) Export-GDP Ratio



(b) Trade Balance-GDP Ratio

Figure A.31: Trade Ratios - Hungary

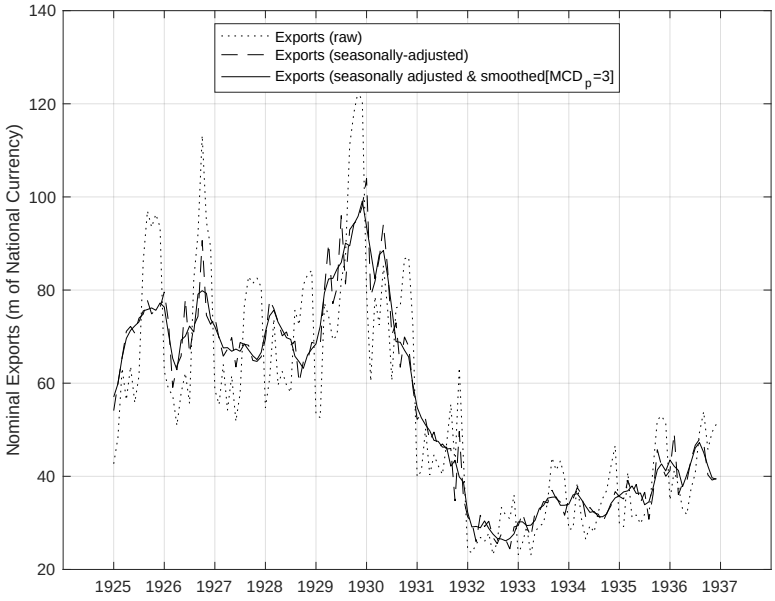


Figure A.32: Monthly Export Data - Hungary

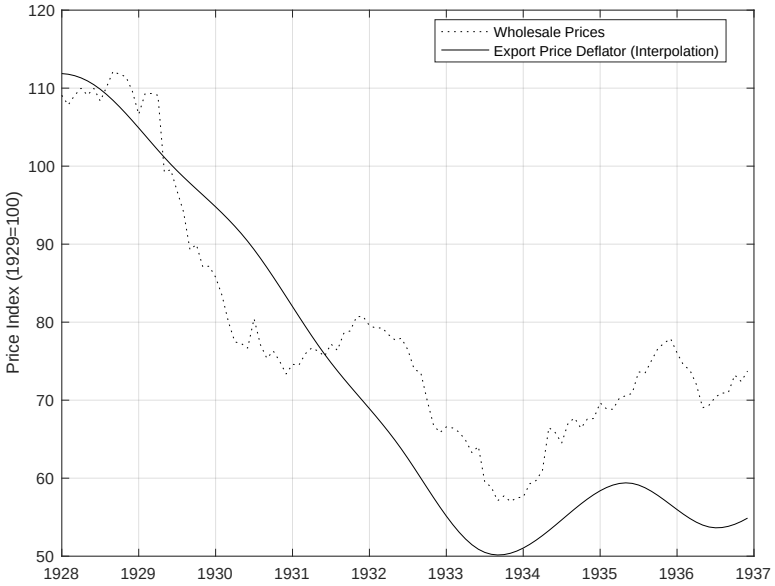
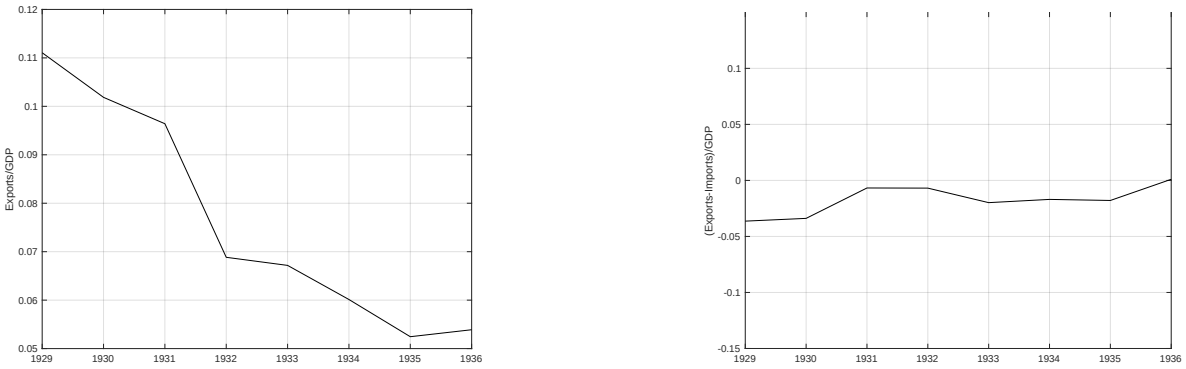


Figure A.33: Price Indices Data - Hungary

A.12. Data Italy

TABLE A.12: DATA SOURCES: ITALY

Variable	Unit	Source	Note
Real GDP	m 1938 Lira	Baffigi (2011)	
Nominal GDP	m Lira	Baffigi (2011)	
Nominal Exports	m Lira	Baffigi (2011)	
Nominal Imports	m Lira	Baffigi (2011)	
Export Price Deflator	Index (1938 = 1)	Baffigi (2011)	Implicit export deflator from Historical National Accounts by Baffigi (2011).



(a) Export-GDP Ratio

(b) Trade Balance-GDP Ratio

Figure A.34: Trade Ratios - Italy

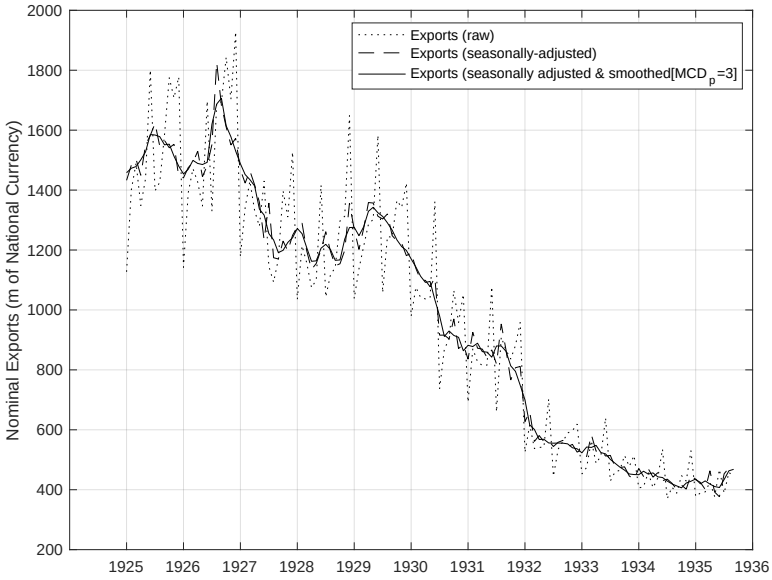


Figure A.35: Monthly Export Data - Italy

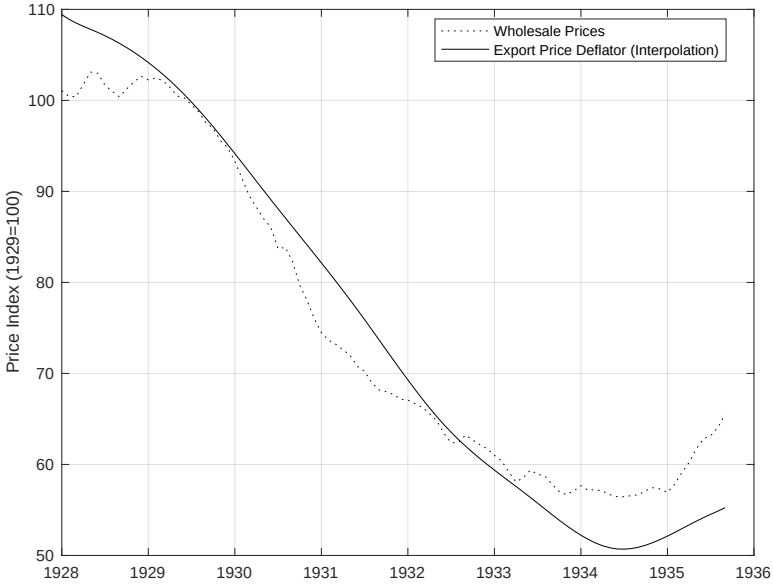
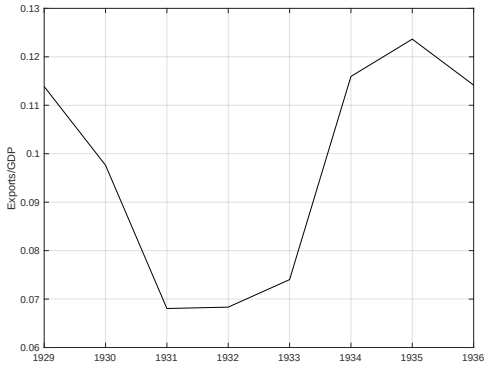


Figure A.36: Price Indices Data - Italy

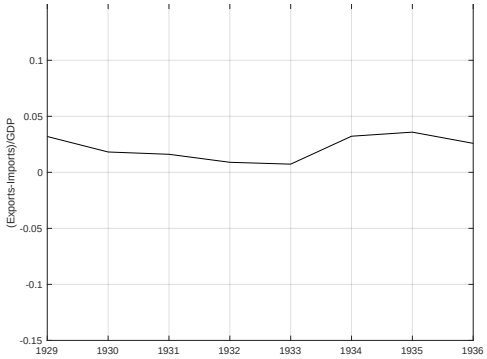
A.13. Data Mexico

TABLE A.13: DATA SOURCES: MEXICO

Variable	Unit	Source	Note
Real GDP	m 1960 Pesos	Cárdenas (1987, p. 190)	
Nominal GDP	m Pesos	Cárdenas (1987, p. 190)	
Nominal Exports	m Pesos	Cárdenas (1987, p. 230)	
Nominal Imports	m Pesos	Cárdenas (1987, p. 241)	
Export Price Deflator	Index (1929 = 100)	Cárdenas (1987, p. 190)	In absence of better alternatives, I use the GDP deflator which I derive from the real and nominal GDP estimates by Cárdenas (1987, p. 190). I rebase it to 1929.



(a) Export-GDP Ratio



(b) Trade Balance-GDP Ratio

Figure A.37: Trade Ratios - Mexico

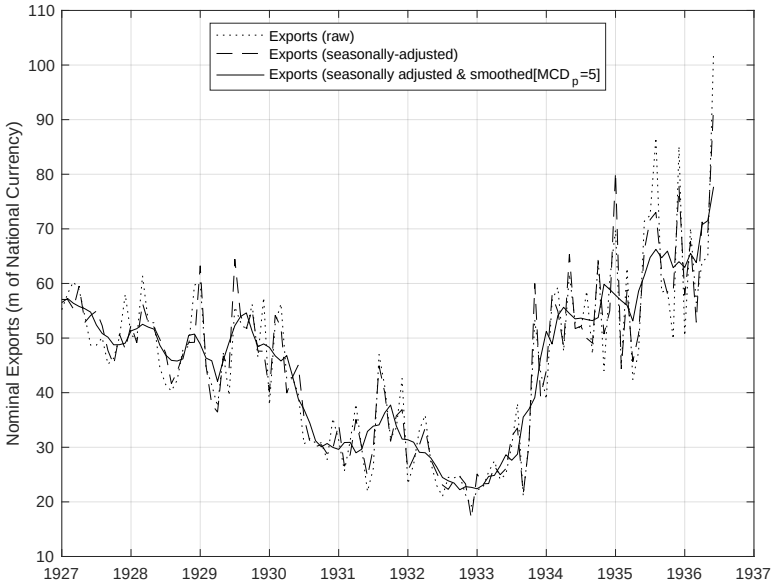


Figure A.38: Monthly Export Data - Mexico

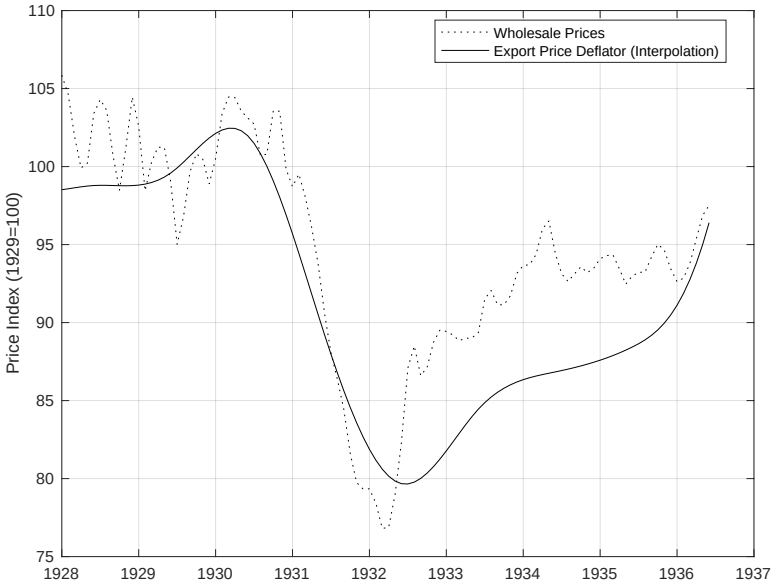
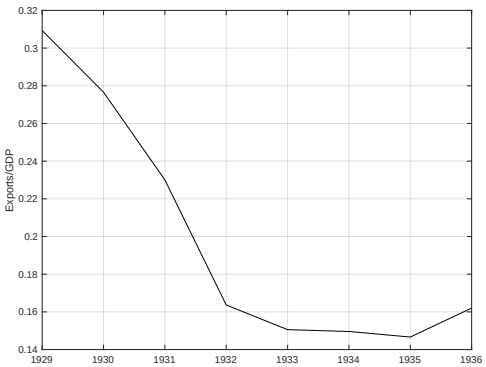


Figure A.39: Price Indices Data - Mexico

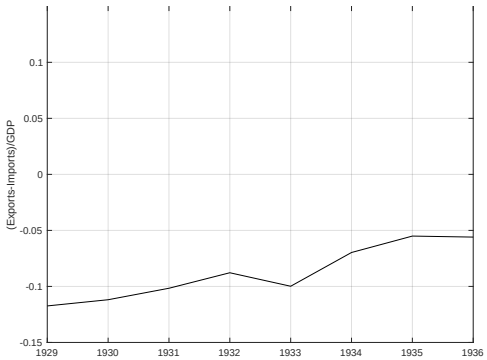
A.14. Data Netherlands

TABLE A.14: DATA SOURCES: NETHERLANDS

Variable	Unit	Source	Note
Real GDP	m 1913 Guilders	Smits et al. (2009)	
Nominal GDP	m Guilders	Bakker et al. (1990, p. 201)	
Nominal Exports	m Guilders	Mitchell (2014)	
Nominal Imports	m Guilders	Mitchell (2014)	
Export Price Deflator	Index (1929 = 100)	Mitchell (2014),Bakker et al. (1990, p. 204)	Implicit deflator based on export volume and value index.



(a) Export-GDP Ratio



(b) Trade Balance-GDP Ratio

Figure A.40: Trade Ratios - Netherlands

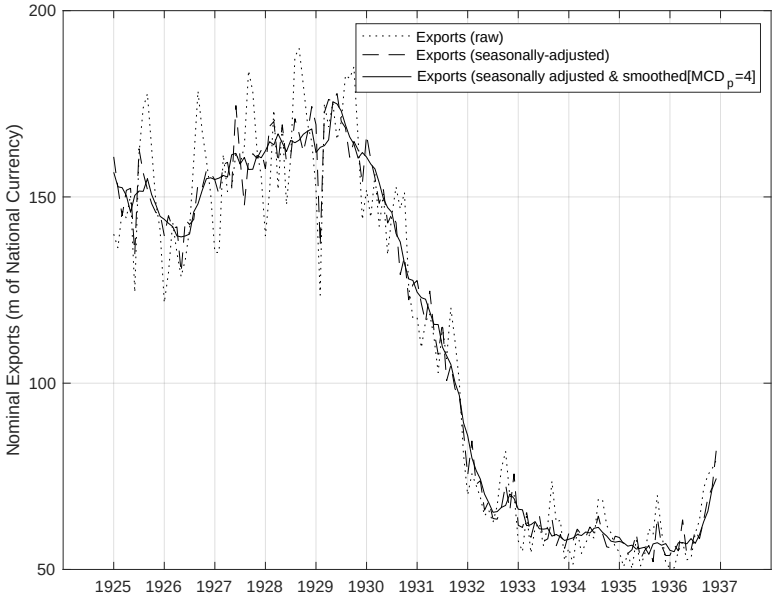


Figure A.41: Monthly Export Data - Netherlands

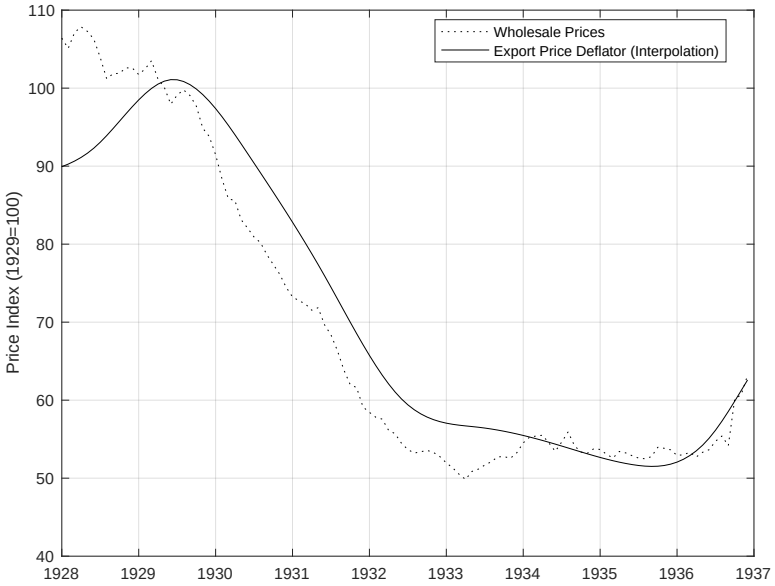
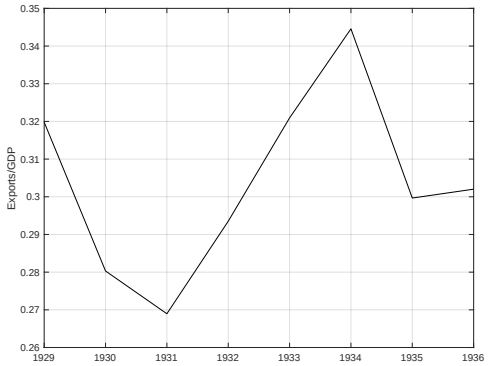


Figure A.42: Price Indices Data - Netherlands

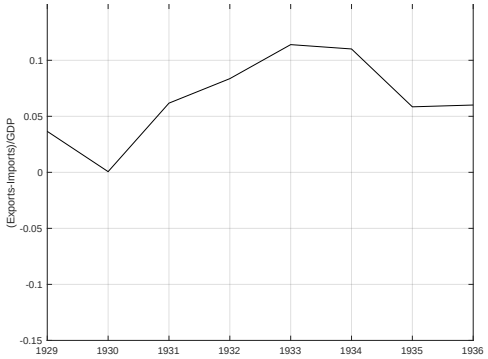
A.15. Data New Zealand

TABLE A.15: DATA SOURCES: NEW ZEALAND

Variable	Unit	Source	Note
Real GDP	m 1911 Pounds	Rankin (1992, p. 61)	
Nominal GDP	m Pounds	Statistics New Zealand (2016)	
Nominal Exports	m Pound	Mitchell (2014)	
Nominal Imports	m Pounds	Mitchell (2014)	
Export Price Deflator	Index (1929 = 100)	Mitchell (2014)	I build the implicit deflator from the nominal and real exports. The index by the League of Nations (1939) seeems to overemphasise the fall in prices, leading to a strong growth in real exports.



(a) Export-GDP Ratio



(b) Trade Balance-GDP Ratio

Figure A.43: Trade Ratios - NewZealand

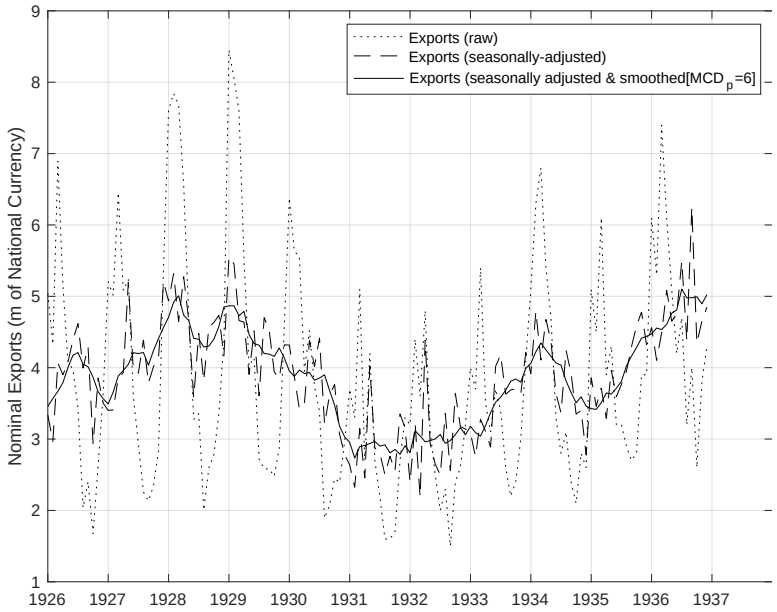


Figure A.44: Monthly Export Data - New Zealand

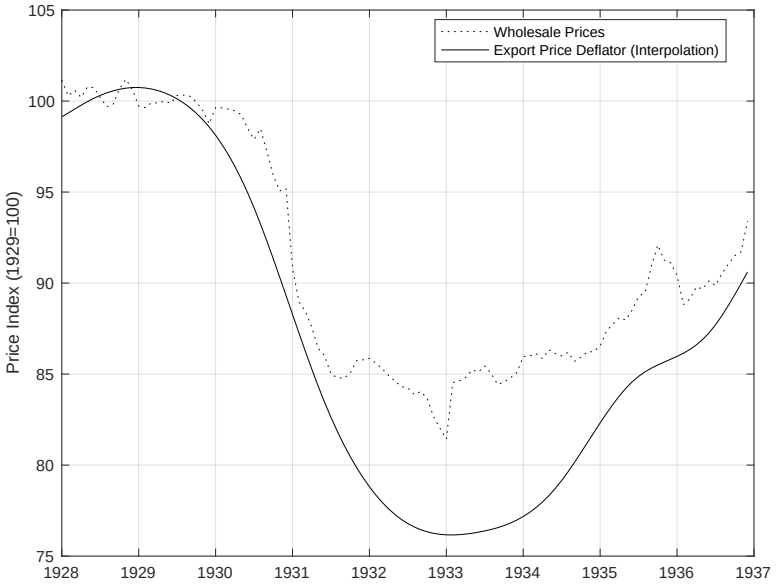
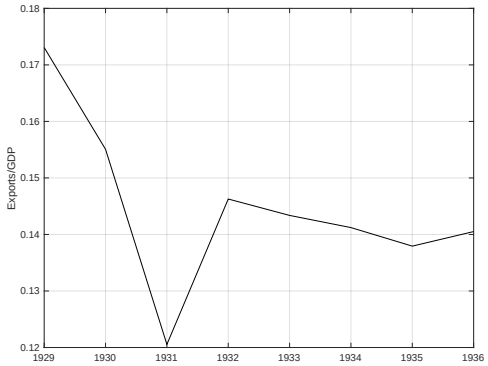


Figure A.45: Price Indices Data - New Zealand

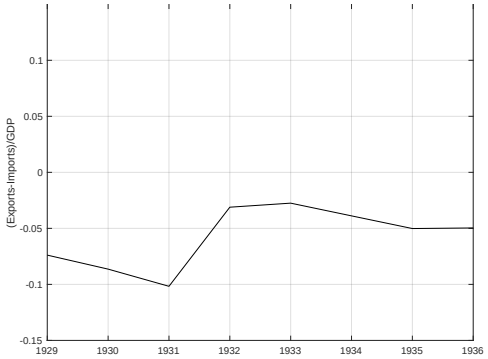
A.16. Data Norway

TABLE A.16: DATA SOURCES: NORWAY

Variable	Unit	Source	Note
Real GDP	m Kroner (1938 prices)	Central Bureau of Statistics Norway (1952, p. 128)	
Nominal GDP	m Kroner	Central Bureau of Statistics Norway (1952, p. 104)	
Nominal Exports	m Kroner	Mitchell (2014)	
Nominal Imports	m Kroner	Mitchell (2014)	
Export Price Deflator	Index (1927 = 100)	League of Nations (1939)	



(a) Export-GDP Ratio



(b) Trade Balance-GDP Ratio

Figure A.46: Trade Ratios - Norway

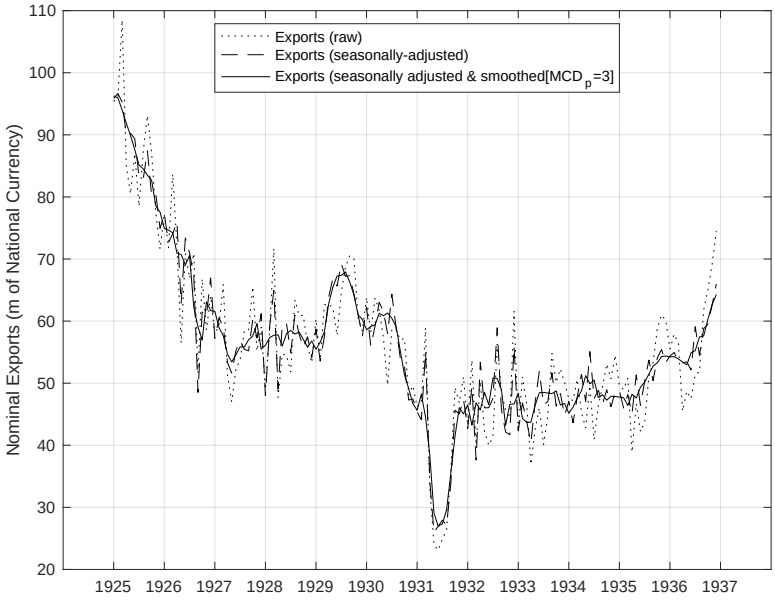


Figure A.47: Monthly Export Data - Norway

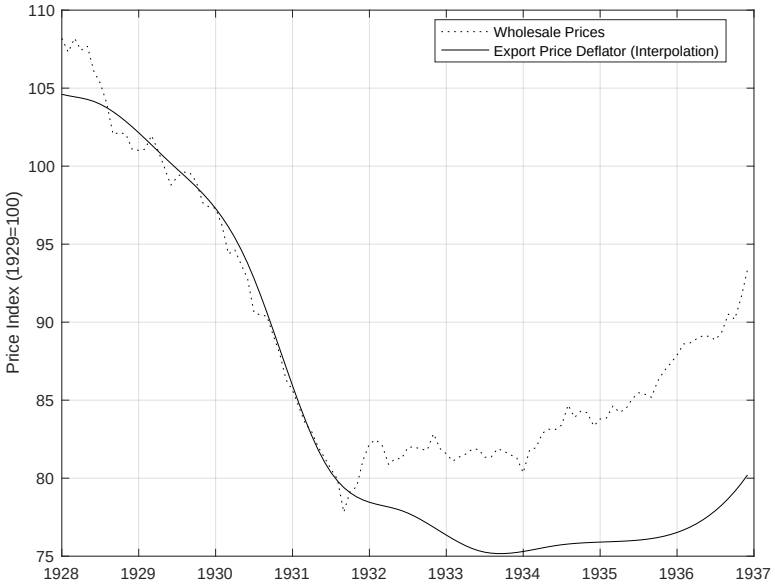


Figure A.48: Price Indices Data - Norway

A.17. Data Poland

TABLE A.17: DATA SOURCES: POLAND

Variable	Unit	Source	Note
Real GDP	m 1929 Zlotys	Roses and Wolf (2010, p. 190), Broadberry and Klein (2012), Landau (1976)	GDP: I interpolate between the years 1925 and 1929 as no estimates are available. For this I use the 1922 estimate in Roses and Wolf (2010, p. 190) and GDP data from Broadberry and Klein (2012) for 1929 onwards. While this linear interpolation is far from perfect, it corresponds well with the growth path of industrial production estimates Mitchell (see 2014). Finally, I scale the estimate on the 1929 Benchmark value by Landau.
Nominal GDP	m Zlotys	Laski (1956, p. 90), League of Nations (1940, p. 236), Statistisches Reichsamt (1936, p. 222).	Constructed based on the GDP deflator and the real GDP.
Nominal Exports	m Zlotys	Mitchell (2014)	Includes gold movements until 1926. However, the difference for the year where both are given is very small.
Nominal Imports	m Zlotys	Mitchell (2014)	Includes gold movements until 1926. However, the difference for the year where both are given is very small.
Export Price Deflator	Index (1929 = 100)	Laski (1956, p. 90), League of Nations (1940, p. 236), Statistisches Reichsamt (1936, p. 222).	In the absence of a better alternative, I use the GDP deflator.

(a) Export-GDP Ratio

(b) Trade Balance-GDP Ratio

Figure A.49: Trade Ratios - Poland

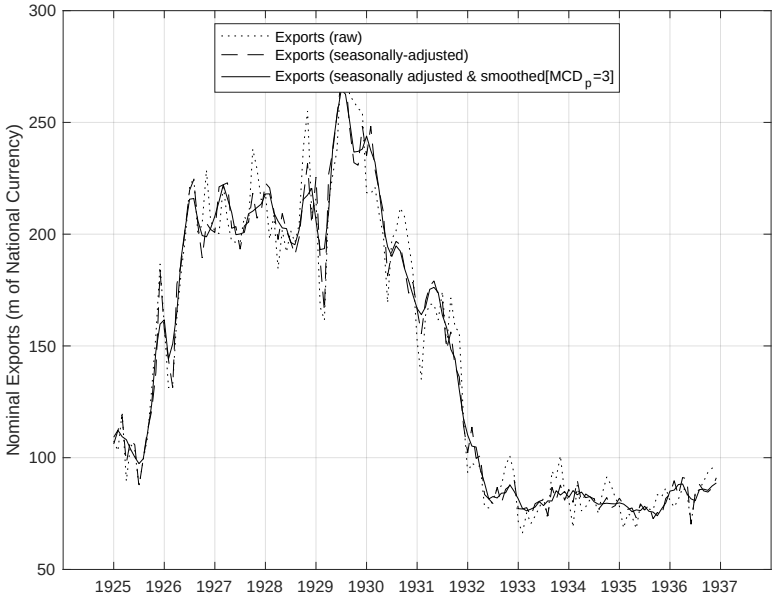


Figure A.50: Monthly Export Data - Poland

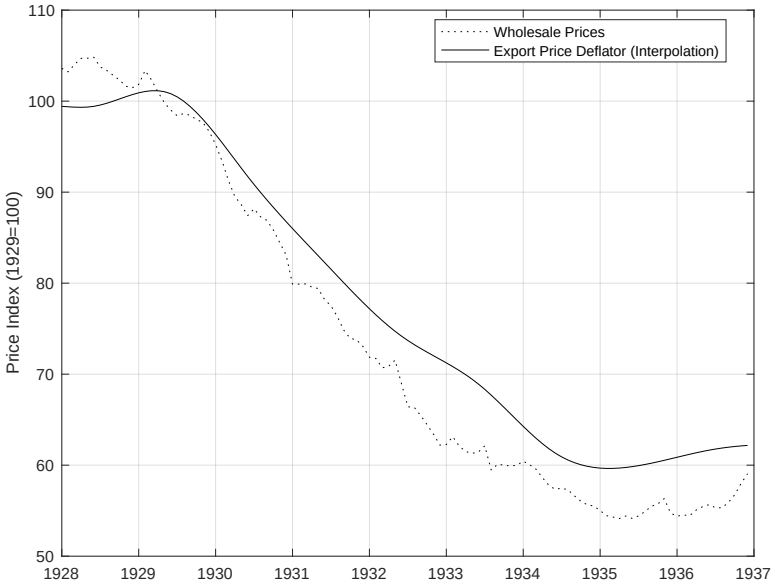
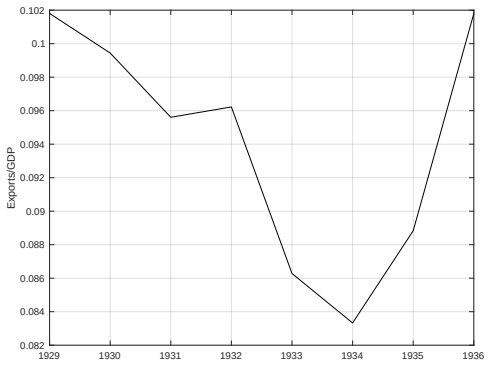


Figure A.51: Price Indices Data - Poland

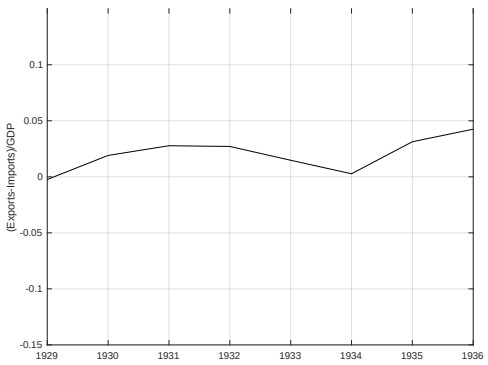
A.18. Data Romania

TABLE A.18: DATA SOURCES: ROMANIA

Variable	Unit	Source	Note
Real GDP	m 1929 Lei	Savoiu and Manea (2014),Bank of Greece et al. (2014)	I rebase the real GDP estimates given in Savoiu and Manea (2014) on the 1929 nominal GDP given in Bank of Greece et al. (2014).
Nominal GDP	m Lei	Bank of Greece et al. (2014)	
Nominal Exports	m Lei	Bank of Greece et al. (2014)	
Nominal Imports	m Lei	Bank of Greece et al. (2014)	
Export Price Deflator	Index (1929 = 100)	Savoiu and Manea (2014),Bank of Greece et al. (2014)	In the absence of a better alternative, I use the GDP deflator.



(a) Export-GDP Ratio



(b) Trade Balance-GDP Ratio

Figure A.52: Trade Ratios - Romania

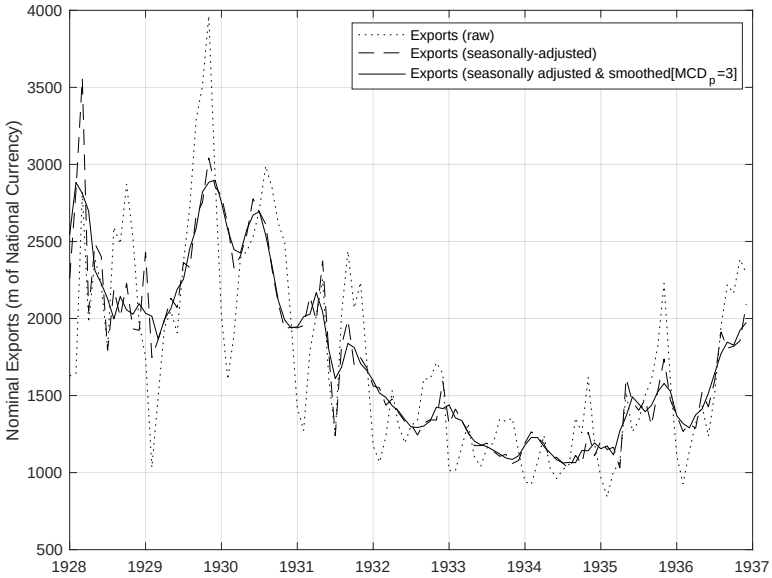


Figure A.53: Monthly Export Data - Romania

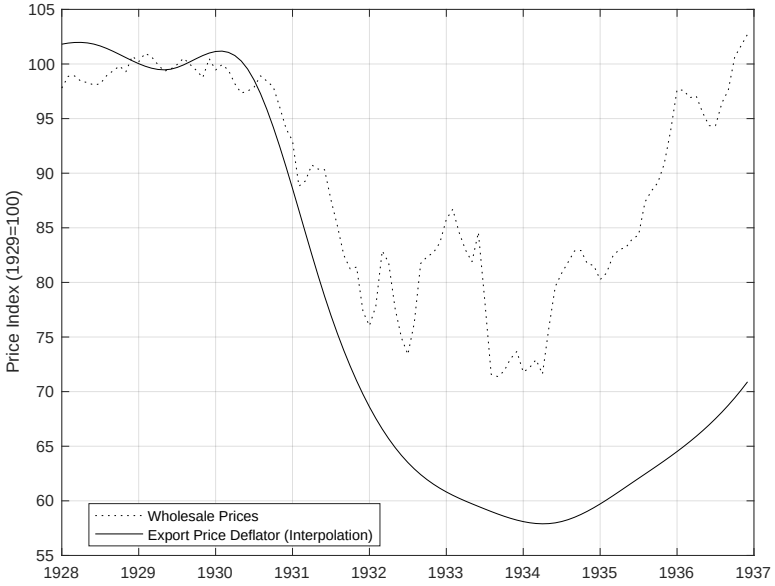
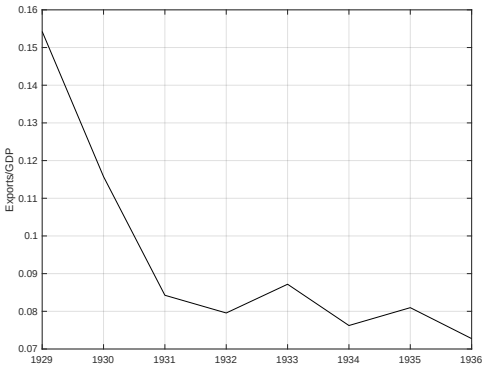


Figure A.54: Price Indices Data - Romania

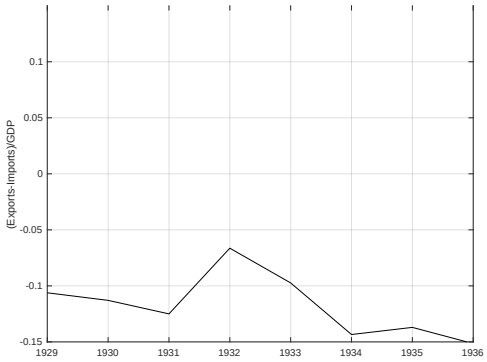
A.19. Data South Africa

TABLE A.19: DATA SOURCES: SOUTH AFRICA

Variable	Unit	Source	Note
Real GDP	m 2011 US $	Bolt et al. (2018)	I take the GDP per capita from the Madisson database and multiply it with the population estimate by Frankema and Jerven (2014).
Nominal GDP	m Rand	Mitchell (2007, p. 1062)	
Nominal Exports	m Rand	Statistisches Reichsamt (1936), League of Nations (1939)	Excludes gold. Converted into Rand (1 : 2).
Nominal Imports	m Rand	Mitchell (2007, p. 1062)	Converted into Rand (1 : 2).
Export Price Deflator	Index (1927 = 100)	League of Nations (1939)	



(a) Export-GDP Ratio



(b) Trade Balance-GDP Ratio

Figure A.55: Trade Ratios - SouthAfrica

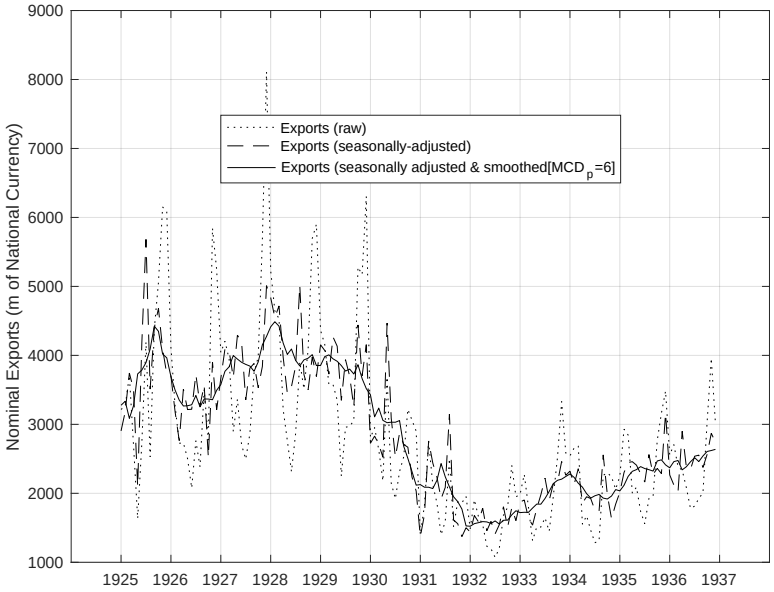


Figure A.56: Monthly Export Data - South Africa

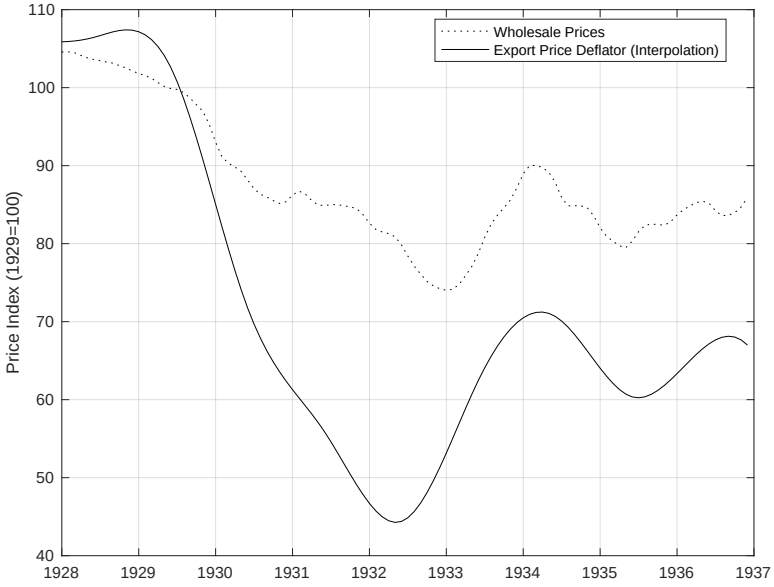
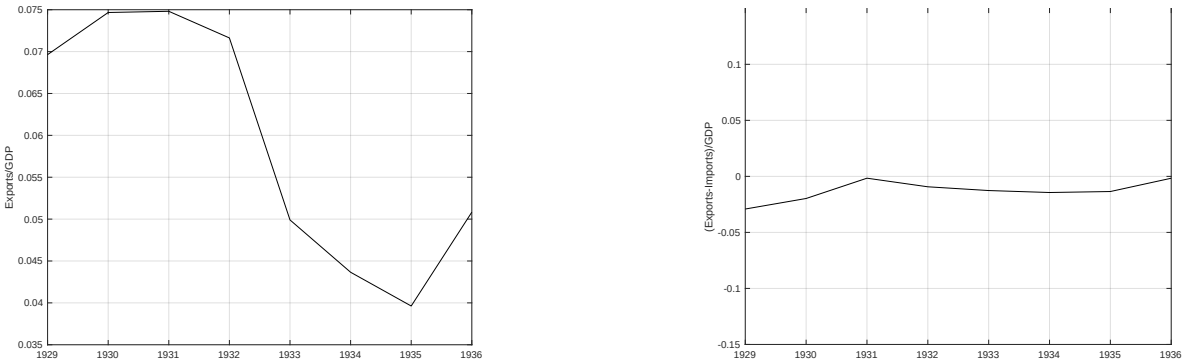


Figure A.57: Price Indices Data - South Africa

A.20. Data Spain

TABLE A.20: DATA SOURCES: SPAIN

Variable	Unit	Source	Note
Real GDP	m Euro (2010 prices)	Prados de la Escosura (2016)	
Nominal GDP	m Euro (current)	Prados de la Escosura (2016)	
Nominal Exports	Euro (current)	Prados de la Escosura (2016)	
Nominal Imports	Euro (current)	Prados de la Escosura (2016)	
Export Price Deflator	Index (2010 = 100)	Prados de la Escosura (2016)	



(a) Export-GDP Ratio

(b) Trade Balance-GDP Ratio

Figure A.58: Trade Ratios - Spain

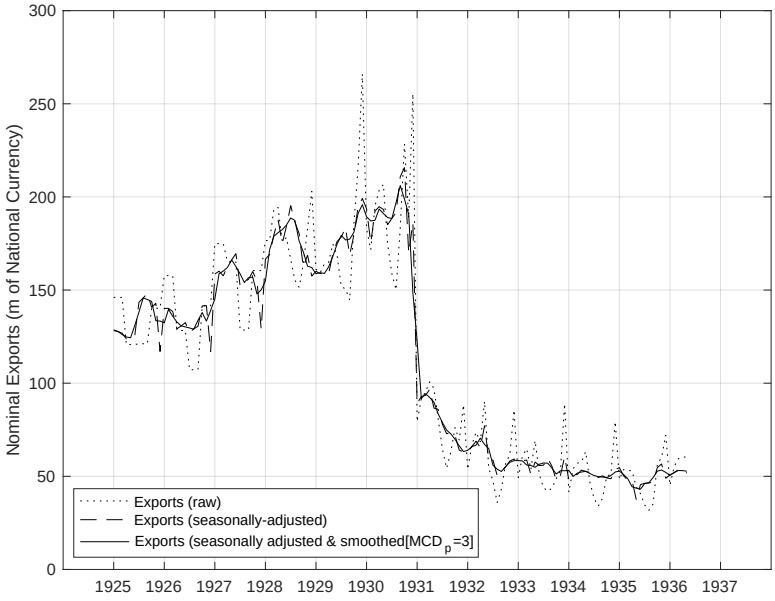


Figure A.59: Monthly Export Data - Spain

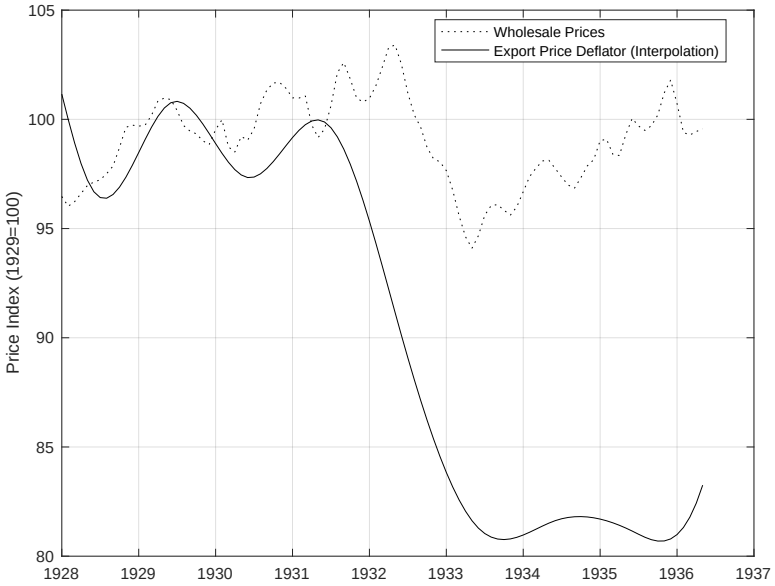
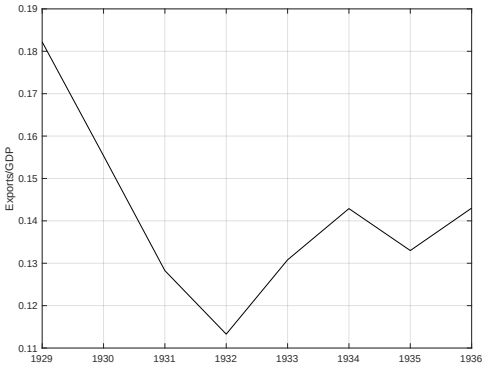


Figure A.60: Price Indices Data - Spain

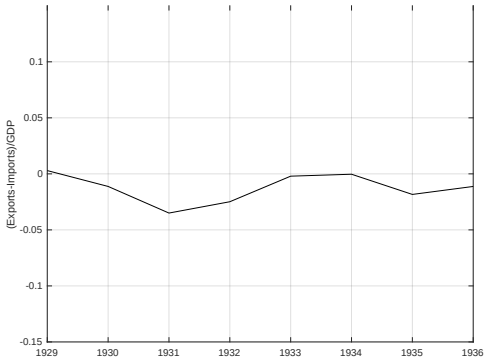
A.21. Data Sweden

TABLE A.21: DATA SOURCES: SWEDEN

Variable	Unit	Source	Note
Real GDP	m Swedish Crowns (1913 prices)	Johansson (1967, p. 153)	
Nominal GDP	m Swedish Crowns	Johansson (1967, p. 151)	
Nominal Exports	m Kronor	Mitchell (2014)	
Nominal Imports	m Kronor	Mitchell (2014)	
Export Price Deflator	Inde (1927 = 100)	Mitchell (2014), Johansson (1967, p. 141)	Implicit deflator based on nominal and real exports. I then base this index to 1927.



(a) Export-GDP Ratio



(b) Trade Balance-GDP Ratio

Figure A.61: Trade Ratios - Sweden

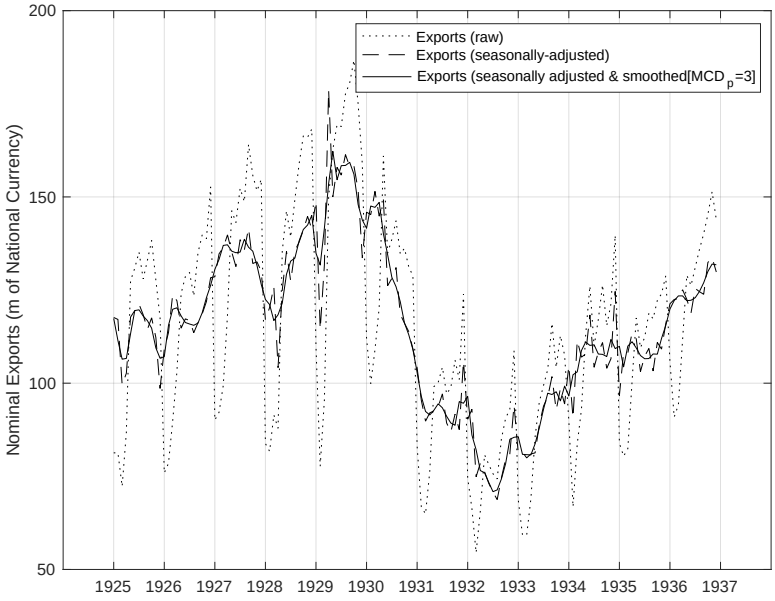


Figure A.62: Monthly Export Data - Sweden

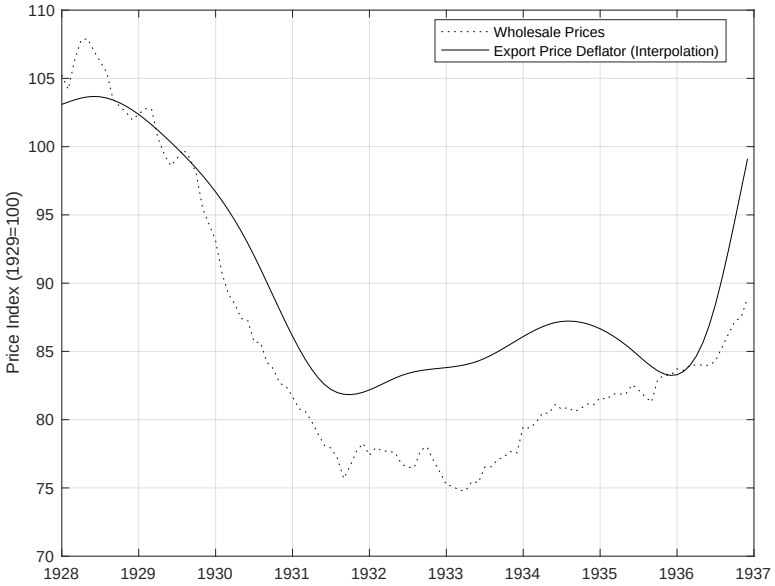
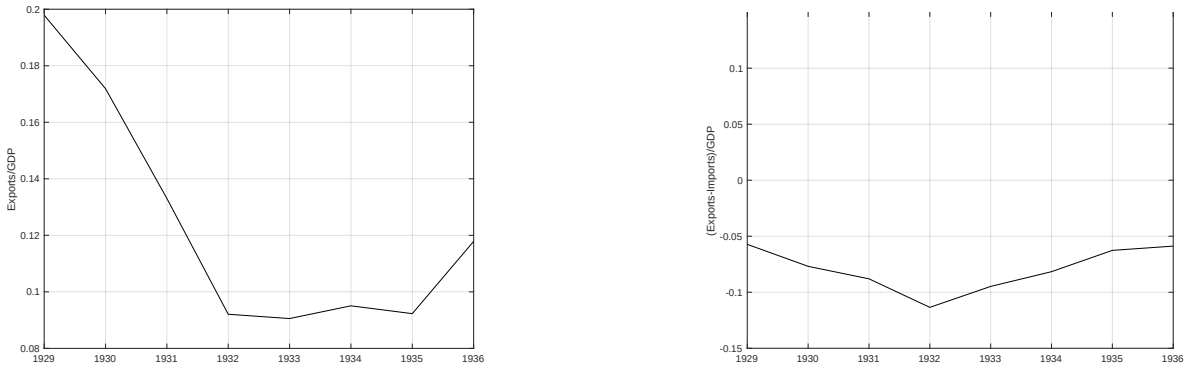


Figure A.63: Price Indices Data - Sweden

A.22. Data Switzerland

TABLE A.22: DATA SOURCES: SWITZERLAND

Variable	Unit	Source	Note
Real GDP	m 1925 Swiss Frank	Gerlach and Gerlach-Kristen (2005), Historical Statistics of Switzerland (2016, Q.16a)	I base the real indicator of Gerlach and Gerlach-Kristen (2005) on the 1925 GDP Historical Statistics of Switzerland (2016, Q.16a).
Nominal GDP	m Swiss Frank	Gerlach and Gerlach-Kristen (2005), Historical Statistics of Switzerland (2016, Q.16a)	I base the nominal indicator of Gerlach and Gerlach-Kristen (2005) on the 1925 GDP Historical Statistics of Switzerland (2016, Q.16a).
Nominal Exports	m Swiss Frank	Statistisches Reichsamt (1936), League of Nations (1939).	As data are only available from 1927 until 1933, I use the value index by the League of Nations (1939) to calculate the nominal exports for 1931-1937.
Nominal Imports	m Swiss Frank	Statistisches Reichsamt (1936), League of Nations (1939).	As data are only available from 1927 until 1933, I use the value index by the League of Nations (1939) to calculate the nominal exports for 1931-1937.
Export Price Deflator	Index (1927 = 100)	League of Nations (1939)	



(a) Export-GDP Ratio

(b) Trade Balance-GDP Ratio

Figure A.64: Trade Ratios - Switzerland

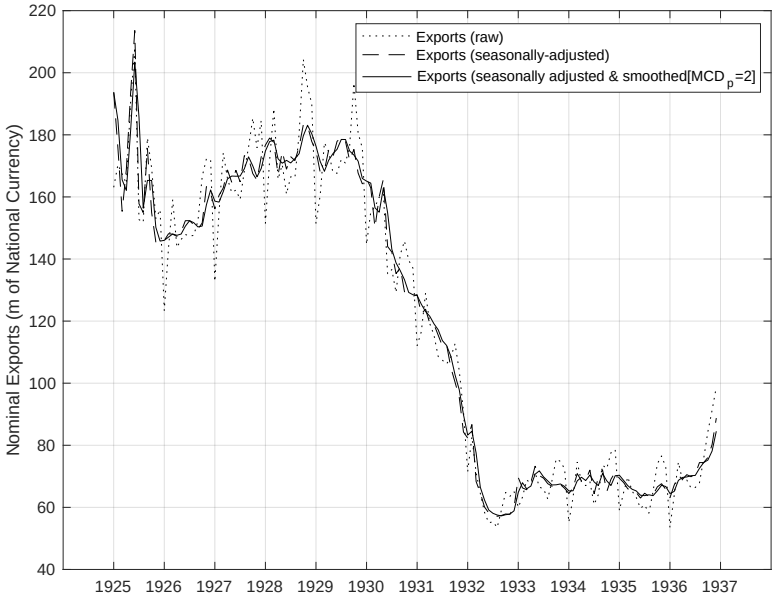


Figure A.65: Monthly Export Data - Switzerland

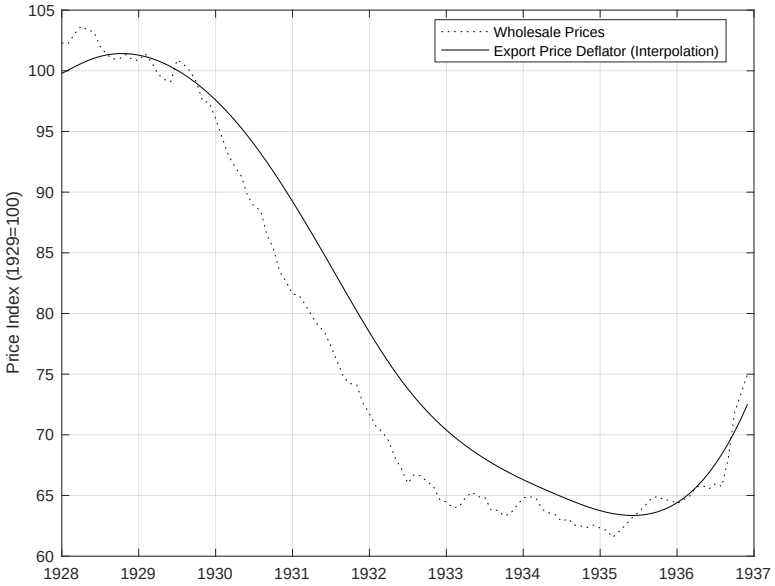


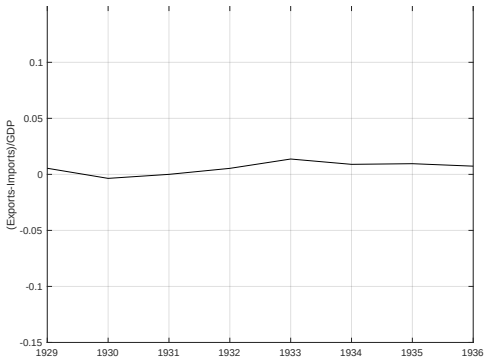
Figure A.66: Price Indices Data - Switzerland

A.23. Data Yugoslavia

TABLE A.23: DATA SOURCES: YUGOSLAVIA

Variable	Unit	Source	Note
Real GDP	m Dinar (1938 prices)	Bank of Greece et al. (2014)	
Nominal GDP	m Dinar	Bank of Greece et al. (2014)	
Nominal Exports	m Dinar	Bank of Greece et al. (2014)	
Nominal Imports	m Dinar	Bank of Greece et al. (2014)	
Export Price Deflator	Index (1926=100)	Bank of Greece et al. (2014)	

(a) Export-GDP Ratio



(b) Trade Balance-GDP Ratio

Figure A.67: Trade Ratios - Yugoslavia

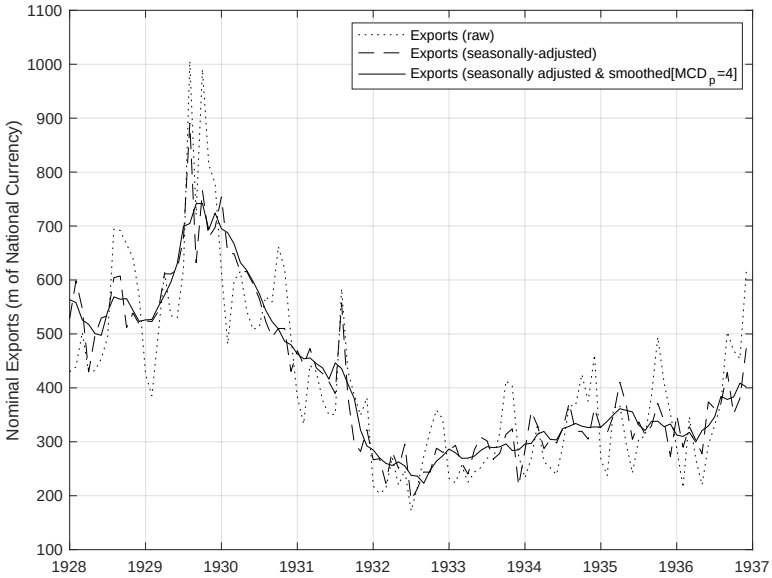


Figure A.68: Monthly Export Data - Yugoslavia

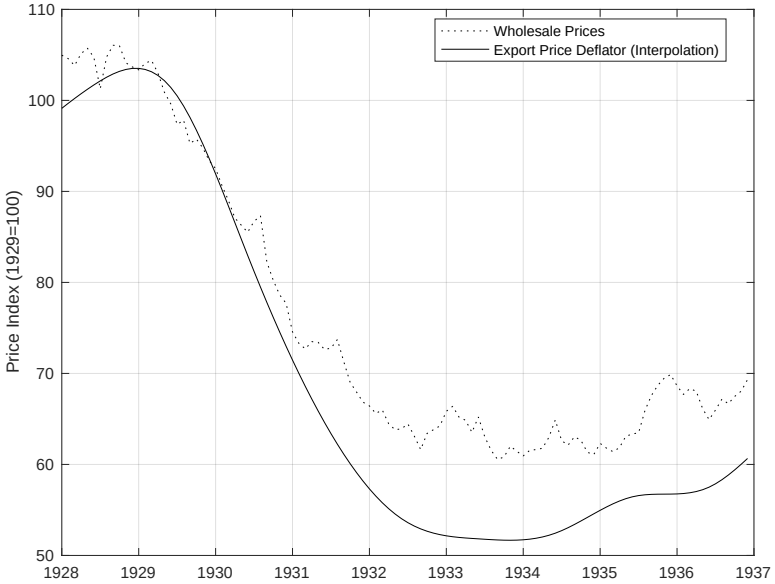


Figure A.69: Price Indices Data - Yugoslavia

B. Calculations

B.1. Estimates of Counterfactual Trade Shares

TABLE A.24: ACTUAL AND COUNTERFACTUAL TRADE SHARES WITH THE THREE LARGE ECONOMIES

	Germany		United Kingdom		United States	
	placebo	actual	placebo	actual	placebo	actual
Australia	34	17	32	73	34	10
Austria	35	73	38	15	27	12
Belgium	36	45	34	30	30	24
Bulgaria	37	94	39	4	24	2
Canada	32	5	36	44	32	51
Chile	33	14	34	47	34	39
Czechoslovakia	34	66	36	21	30	14
Denmark	34	26	37	73	29	1
Estonia	36	48	38	50	26	2
Finland	35	26	36	66	30	9
Hungary	36	82	39	15	25	3
Italy	35	41	35	28	30	30
Mexico	32	12	35	9	33	79
Netherlands	37	47	35	46	29	7
New Zealand	35	3	32	91	34	6
Norway	35	24	36	56	29	20
Poland	34	71	37	27	28	2
Romania	35	76	36	24	29	1
South Africa	34	8	33	90	33	3
Spain	36	23	34	49	30	28
Sweden	35	30	36	50	30	20
Switzerland	36	43	35	34	29	23
Yugoslavia	37	84	39	10	24	6

Source: See A for the underlying trade data. The miniature gravity model employed to derive these shares is discussed in Section 2.7.

Note: All values are given in percentages and based on trade data for 1927.

TABLE A.25: ADJUSTMENT OF IMPORTS

Estimator	OLS	IV
	m^{GDP}	m^{GDP}
xp^{GDP}	0.46***	0.54***
	(0.08)	(0.19)
Time FE	No	Yes
Country FE	Yes	Yes
Observations	368	368
R^2	0.20	0.34

Standard errors in parentheses and clustered at the country level.

Instrument is foreign demand as in all other regressions (partial F first stage: 15.07)

* $p < .10$, ** $p < .05$, *** $p < .01$

C. Robustness checks

C.1. Results - Two-way Clustering

TABLE A.26: IV RESULTS (BALANCED SAMPLE) - TWO-WAY CLUSTERING OF ERRORS

Specification	Almunia et al.		Barro-Redlick		Placebo	
	1^{st} Stage	2^{nd} Stage	1^{st} Stage	2^{nd} Stage	1^{st} Stage	2^{nd} Stage
	xp	y	xp^{GDP}	y	xp^{GDP}	y
xp		0.19***				
		(0.05)				
xp^{GDP}				1.24***		1.12
				(0.42)		(1.81)
y^F	3.36***		0.52***		1.46	
	(0.85)		(0.11)		(2.08)	
Control Variables						
π	-1.18***	0.26***	-0.16***	0.22***	-0.14**	0.21
	(0.36)	(0.06)	(0.06)	(0.07)	(0.07)	(0.27)
GS	-0.07*	0.02**	-0.01*	0.02**	-0.01*	0.01
	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
XC	-0.07***	0.01	-0.01	0.01	-0.01	0.01
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Observations	368	368	368.	368	368	368
Partial F	15.66		22.63		0.49	

Standard errors in parentheses.

Standard errors clustered at the country and time dimension using the partial out option for the time fixed effects .

* $p < .10$, ** $p < .05$, *** $p < .01$

TABLE A.27: IV RESULTS (BALANCED SAMPLE) - INCLUDING LAGGED DEPENDENT VARIABLE

Specification	Almunia et al.		Barro-Redlick		Placebo	
	1^{st} Stage	2^{nd} Stage	1^{st} Stage	2^{nd} Stage	1^{st} Stage	2^{nd} Stage
	xp	y	xp^{GDP}	y	xp^{GDP}	y
xp		0.19***				
		(0.05)				
xp^{GDP}				1.17***		0.22
				(0.38)		(1.17)
y^F	3.41***		0.55***		1.42	
	(0.74)		(0.10)		(1.50)	
Control Variables						
π	-1.35***	0.24***	-0.18***	0.20**	-0.16***	0.05
	(0.30)	(0.07)	(0.05)	(0.08)	(0.05)	(0.17)
GS	-0.08***	0.02**	-0.01**	0.01*	-0.01**	0.00
	(0.03)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
XC	-0.06*	0.01*	-0.01	0.01	-0.01	0.00
	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
L.y	0.77***	0.16**	0.08	0.21***	0.07	0.28*
	(0.28)	(0.08)	(0.05)	(0.08)	(0.05)	(0.15)
Observations	345	345	345	345	345	345
Partial F	21.46		27.94		0.90	

Standard errors in parentheses.

Standard errors clustered at the country level.

* $p < .10$, ** $p < .05$, *** $p < .01$

C.3. Results - Full Sample

TABLE A.28: IV RESULTS - FULL SAMPLE

Specification	Almunia et al.		Barro-Redlick		Placebo	
	1^{st} Stage	2^{nd} Stage	1^{st} Stage	2^{nd} Stage	1^{st} Stage	2^{nd} Stage
	xp	y	xp^{GDP}	y	xp^{GDP}	y
xp		0.23**				
		(0.10)				
xp^{GDP}				1.77**		-7.45
				(0.87)		(64.51)
y^F	1.10***		0.14**		0.07	
	(0.36)		(0.07)		(0.60)	
Control Variables						
π	-0.60***	0.11**	-0.07***	0.10*	-0.07***	-0.54
	(0.15)	(0.06)	(0.02)	(0.06)	(0.02)	(4.53)
GS	-0.02***	0.00	-0.00**	0.00	-0.00**	-0.03
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.20)
XC	-0.02***	0.00	-0.00***	0.00	-0.00**	-0.03
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.20)
L.y	0.33*	0.31***	0.06***	0.27***	0.06***	0.84
	(0.17)	(0.07)	(0.02)	(0.07)	(0.02)	(3.97)
Observations	963	963	963	963	963	963
Partial F	9.03		4.42		0.01	

Standard errors in parentheses.

Standard errors clustered at the country level.

* $p < .10$, ** $p < .05$, *** $p < .01$

C.4. Results - Based on Economic Activity Indices Excluding Trade Data

In this sample, Bulgaria, Estonia and New Zealand are dropped as the economic activity indices excluding trade data were not available (minimum 5 indicators to base the monthly estimates on).

TABLE A.29: IV RESULTS (BALANCED SAMPLE) - BASED ON ECONOMIC ACTIVITY INDICES EXCLUDING TRADE DATA

Specification	Almunia et al.		Barro-Redlick		Placebo	
	1^{st} Stage	2^{nd} Stage	1^{st} Stage	2^{nd} Stage	1^{st} Stage	2^{nd} Stage
	xp	y	xp^{GDP}	y	xp^{GDP}	y
xp		0.20***				
		(0.07)				
xp^{GDP}				1.34**		2.59
				(0.53)		(3.08)
y^F	3.51***		0.54***		1.45	
	(0.96)		(0.13)		(1.65)	
Observations	320	320	320	320	320	320
Countries	20	20	20	20	20	20
Partial F	13.50		18.13		0.77	

Standard errors in parentheses and clustered at the country level.

Controls included, but not shown: wholesale price inflation, gold standard adherence, imposition of foreign exchange controls, time and country fixed effects.

The median ratio of exports to GDP for this sample is .161

* $p < .10$, ** $p < .05$, *** $p < .01$

C.5. Results - Un-smoothed Data & Two-way Clustering

In this specification, neither the export data nor the wholesale price inflation data are smoothed before aggregating it into quarterly data. Two-way clustered standard errors are applied.

TABLE A.30: IV RESULTS (BALANCED SAMPLE) - UN-SMOOTHED EXPORT & PRICE DATA

	1^{st} Stage xp	2^{nd} Stage y	1^{st} Stage xp^{GDP}	2^{nd} Stage y	1^{st} Stage xp^{GDP}	2^{nd} Stage y
xp		0.15***				
		(0.04)				
xp^{GDP}				1.05***		0.42
				(0.39)		(0.62)
y^F	4.24***		0.59***		4.26	
	(1.35)		(0.17)		(2.64)	
Control Variables						
π	-1.23***	0.24***	-0.17**	0.24***	-0.15	0.15
	(0.46)	(0.06)	(0.08)	(0.08)	(0.09)	(0.09)
GS	-0.07	0.02**	-0.01	0.02**	-0.01*	0.01
	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
XC	-0.05*	0.01	-0.01	0.00	-0.01	-0.00
	(0.03)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Observations	368	368	368	368	368	368
Partial F	9.90		12.46		2.60	

Standard errors in parentheses.

Standard errors clustered at the country and time dimension using the partial out option for the time fixed effects .

* $p < .10$, ** $p < .05$, *** $p < .01$

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Appendices