Recovery from financial crises in peripheral economies, 1870-1913[*]

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Abstract

What drives recoveries after financial crises? I address this question for the 1870-1913 "first era of globalization," a period when international economic integration meant that terms of trade movements could have significant national-level impacts, but before governments were engaged in widespread economic management. Protectionism was one of the few economic policy options available at this time. The impacts of these two factors – terms of trade and tariff rates – over this period have been studied before. Previous studies have found negative relationships between terms of trade volatility and GDP growth. The findings for tariffs have been more contentious, with some studies finding positive relationships with GDP growth over this period while others find negative results. But these studies have not looked specifically at how these factors influenced recoveries from financial crises. Using local projections, I find that tariff shocks had a positive impact on GDP in post-crisis periods, while terms of trade shocks had a slightly negative impact. The tariff results are especially pronounced in temperate economies, whereas the terms of trade results are more of a feature of tropical economies. Overall this suggests that national governments, through trade policies, played a more significant role in shaping economic outcomes during this period than is typically recognized.

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"To excuse an indifference towards the control of depressions because the latter are always followed by revival is, indeed, tantamount to saying that we should not seek to abolish or lessen wars because they, too, are always followed by a period of peace." Paul Douglas (U.S. Senator and economist) (1935, pp. 80-81)

1   Introduction

The 2007-08 financial crisis generated renewed interest in the factors that cause financial crises. But as more time has passed, attention has turned toward recoveries from crises. Since developed countries did not experience many crises over the second half of the twentieth century, this line of research has had to reach further back into history to times of greater macroeconomic turbulence to investigate a larger sample of recovery periods.

Reinhart and Rogoff (2014), for example, present a comprehensive overview of the available historical data on recoveries from financial crises. They measure the number of years for business cycle peaks-to-troughs and peaks-to-recoveries over 100 crisis periods from 1857-2013.[1] Other long-run and historical studies of recoveries from financial crises tend to be more narrowly focused on specific periods, especially the Great Depression.[2] In this paper I focus on the 1870-1913 period, which saw an especially large number of crises. Several previous studies are particularly relevant for the task at hand. Empirically, I follow Rocha and Solomou (2015) and Romer and Romer (2016) by using Jordà's (2005) local projection method to analyze post-crisis recovery periods. Specifically, I test the impact that terms of trade[3] and tariff[4] shocks have on economic output in post-crisis periods.

Improving terms of trade have been connected with higher GDP levels and growth

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[1]Related studies of the recoveries from financial crises include Baldacci, Gupta, and Mulas-Granados (2009), Fatás and Mihov (2013), Ha and Kang (2015), Reinhart and Rogoff (2009a, 2009b). Also see the research on whether recoveries occur as "Phoenix Miracles" (when recoveries happen without a reliance on credit): Calvo, Izquierdo, and Talvi (2006), Biggs, Mayer, and Pick (2010). Additionally, Brunnermeier and Schabel (2016) study 400 years of bubbles, crises, and recoveries, looking at central banks' roles through each of these business cycle phases.

[2]Economic studies of the interwar period are too numerous to cite here in full, but several recent studies that focus on recovery during the 1930s include Eggertsson (2012), Payne and Uren (2014), Jalil and Rua (2016), Taylor and Neumann (2016), Chouliarakis and Gwiazdowski (2017), and Hausman, Rhode, and Wieland (2017). A contemporary study focusing on the question of recovery at this time is Brown et al. (1968 [1934]).

[3]Terms of trade is the ratio of export to import prices. See Section 4 for details.

[4]Tariff rates are measured as total government revenue from imports over the value of imports to a given country in a given year. See Section 4 for details.

rates.[5] This could occur through a capital accumulation channel (Blattman, Hwang, and Williamson, 2007), or through productivity improvements due to the ability to import more productivity-enhancing capital goods (Basu and McLeod, 1992). In the long run, however, investment could be tempered by a "resource curse" effect (Sachs and Warner, 1995, 2001), or rent-seeking behavior among resource rich elites (Krueger, 1974). Blattman et al. (2007) contribute to this research by distinguishing between terms of trade growth and volatility.[6] They find a significant negative relationship between terms of trade volatility and economic growth in peripheral countries from 1870-1939, versus no significant relationship between terms of trade growth and income growth. Their approach is based on medium to long-run time frames (2007, p. 168). Research looking at the relationship between terms of trade movements and economic growth in recent decades also takes a longer-run approach (Easterly, Kremer, Pritchett, Summers, 1993; Rodrik, 1999; Berg, Ostry, and Zettelmeyer, 2012). In contrast, I focus on the more immediate effects that terms of trade movements can have on output, particularly during the several years after financial crises.[7]

The 1870-1913 period is known as the "first era of globalization" for its high levels of international capital, labor, and trade movements. This period is also notable for the numerous and severe financial crises that occurred. While the interwar period brought increased government involvement in directing economic activity, the pre-World War I period was much more laissez-faire. Overt management of economies by national governments was negligible, with tariff policies being one of the few government interventions in peripheral economies.[8] To address the question of which factors played a more significant role in helping economies recover from crises, terms of trade measures and tariff rates are the best available data we have for comparing whether changes in market conditions (commodity prices accounted for by terms of trade measures) or government actions (specifically tariff policies) had more of an impact on GDP growth in the wake of financial crises.

One of the few measurable factors that affected the severity of economic downturns

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[5]Blattman et al. (2007, p. 160) present a useful overview of this literature.

[6]Blattman et al. (2007, p. 166) use the Hodrick-Prescott (HP) filter to calculate these two factors, terms of trade growth (a smooth trend) and volatility (stationary deviations).

[7]Some other studies, such as Funke, Granziera, and Imam (2008), use annual data in their analysis of how terms of trade shocks impacted economic growth from 1970-2006, but as far as I know this is the first paper to use annual data to specifically focus on post-crisis periods for the 1870-1913 period.

[8]This "laissez-faire" narrative is challenged by recent research looking at the scale of both national and local government involvement in shaping economic outcomes during this period (Novak, 1996, 2008; Palen, 2015).

at this time was a country's terms of trade. This was noted in early studies of this period. Argentina's recovery after the 1890 Baring Crisis, for example, was prolonged in part because of depressed commodity prices (Ford, 1956), and recovery in the United States after the 1893 panic was boosted when commodity prices increased in 1897 (after a double-dip recession occurred in 1896) (White, 1939). Terms of trade data allow these relationships between commodity price movements and broader economic recovery after crises to be tested across peripheral economies over this period.

Tariff policy was one of the main avenues through which national governments could impact economic outcomes at this time. In the United States, for example, one of the main protectionist arguments in the 1890s was that higher tariff rates would promote recovery from the 1893 panic and subsequent depression by assuring producers of both agricultural and manufactured goods that they would benefit under a newly protectionist regime (Bent 2015a, 2015b). There is an extensive literature on tariff rates and economic growth more broadly for this period, with the general finding that higher tariffs were associated with higher economic growth rates, at least before the mid-twentieth century (O'Rourke, 2000; Clemens and Williamson, 2004b; Lehmann and O'Rourke, 2011; Lampe and Sharpe, 2013), though the direction of causation is not always clear (Irwin, 2002a, 2002b). This paper contributes to this literature by focusing on the relationship between tariffs and growth specifically during post-crisis periods, to test protectionists' claims that higher tariff rates would stabilize expectations and promote investment and growth after crises.

The cross-country analysis in this paper tests for the impact that terms of change movements and tariff rates had on economic growth during the globally interconnected and macroeconomically volatile 1870-1913 period. The main empirical finding is that tariff rate shocks had a significant positive impact on GDP growth in post-crisis periods, whereas terms of trade shocks had a slightly negative impact. The tariff results are especially pronounced in temperate economies, whereas the terms of trade results are more of a feature of tropical economies. Altogether this adds to our understanding of how economies recover from financial crises. I conclude that recoveries, especially in the more developed peripheral economies, were due more to government action (at least partly intended to improve macroeconomic performance) than to exogenous market forces.

2 Terms of trade and economic growth

The countries included in this study had largely agricultural economies, which tended to be dominated by a few commodities whose price movements could have broader macroeconomic effects. Describing these trends for the United States at the turn of the twentieth century, the economist A. Piatt Andrew made the following remarks:

> An unusually large harvest in this country, if accompanied by small harvests abroad, obviously means prosperity for the American farmers, means large exports and high prices, tends to mean incoming gold and expanding credit. But, if accompanied by excessive crops abroad and flagging demand, it means, on the other hand, extraordinarily low prices, diminished exports, and depression in agriculture, if not in general trade (1906, p. 329). . . . [T]he beginnings of every movement toward business prosperity and the turning-points toward every business decline . . . were closely connected with the out-turn of crops (ibid., p. 351).

What was true for the United States and other developing economies a hundred years ago remains relevant for developing countries today. The long-run connections between commodity price fluctuations and sovereign defaults are illustrated in Reinhart, Reinhart, and Trebesch (2016), with data on boom-bust cycles over the past 200 years. These relationships were relevant during the 2007-08 crisis (Shelburne, 2010; Bloch and Sapsford, 2011) just as they were for crises at the turn of the last century (Andrew, 1906; Davis, Hanes, and Rhode, 2009).

Terms of trade movements have been associated with changes in economic output and growth more generally. Basu and McLeod (1992), for example, find long-run effects on output for even short-term export price shocks. Similarly, terms of trade shocks help explain differences in growth trajectories across countries, beyond what can be determined by country characteristics such as education levels (Easterly, Kremer, Pritchett, and Summers, 1993).[9] That such shocks have different effects in different countries has also been documented in specific African cases by Deaton (1999), Imam and Salinas (2008), and Fosu (2011).

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[9]Hadass and Williamson (2003, p. 651) suggest otherwise, in their long-run empirical analysis of the Prebisch-Singer hypothesis: "It appears that the great terms-of-trade debate was about an event that was pretty minor for most participants in the center and the periphery. The fundamentals inside these countries mattered most to growth, just as they do today." While that accounts for the long-run relationship between terms of trade and economic growth, the analysis in this paper focuses more narrowly on terms of trade changes in the aftermath of financial crises.

Methodologically, it has been found that analyzing the impact of terms of trade growth and volatility separately makes a difference for explaining the impact of terms of trade movements on economic growth. Blattman, Hwang, and Williamson (2007), for example, find a negative relationship between terms of trade volatility and output from 1870-1939, but no significant relationship between terms of trade growth and economic output. Turnovsky and Chattopadhyay (2003) find similar results for the last quarter of the twentieth century. Relatedly, Basu and McLeod (1992) find that export price volatility decreases domestic investment. More narrowly, Bidarkota and Crucini (2000) highlight the importance of accounting for particular commodities when studying terms of trade volatility in developing countries.

Of the different types of shocks developing countries can experience, Becker and Mauro (2006) find negative terms of trade shocks to have the most severe impact on economic output. Rodrik (1999) and Jerzmanowski (2006) argue that institutions explain much of a country's ability to recover from such shocks.[10] Similarly, Funke, Granziera, and Imam (2008) study the role that particular institutional variables play in recovery periods from 1970-2006. The same range of variables is not available for the 1870-1913 period, but they would be less relevant, since national governments in general did not take as active a role in shaping their country's economies, and estimates of institutional quality would be less informative. My approach is to assess the overall impact that terms of trade shocks had on economies in post-crisis periods in order to see what factors contributed to, or hindered, recoveries from financial crises at this time.

3   Tariffs and economic growth

While national governments in developing countries mostly took a hands-off approach to their economies over the late nineteenth and early twentieth centuries, tariff policies were one of the few ways they directly impacted economic activity. Tariffs can spur economic growth by supporting development through infant industry protection (List, 1909[1841]; Amsden, 1989).[11] In the late nineteenth century, tariffs were also a main source of government revenue, and balancing the budget was a stated aim of protection-

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[10]Rodrik (1999) uses indicators of the quality of governmental institutions, rule of law, democratic rights, and social safety nets as proxies for institutions of conflict management. Jerzmanowski (2006, p. 366) measures institutional quality with an index based on measures of rule of law, risk of expropriation, corruption, bureaucratic quality, and government repudiation contracts.

[11]Allen (2011) presents a useful overview of different countries' experiences with protectionism through the nineteenth and twentieth centuries.

ists.[12] Additionally, the case of the United States during the 1890s depression suggests that decisive increases in tariff rates in the wake of financial crises can signal that the government is willing to protect the domestic economy from foreign competition.[13]

Rodríguez and Rodrik (2000, pp. 267-68) summarize contemporary theories about the impact trade restrictions have on real GDP. Accounting for static models with no market imperfections, neoclassical growth models, and endogenous growth models, they note that "there should be no theoretical presumption in favor of finding an unambiguous, negative relationship between trade barriers and growth rates in the types of cross-national data sets typically analyzed" (ibid., p. 268). These theories also allow for short and long term positive connections between protectionist policies and GDP growth, such as when import-competing sectors have positive production externalities, or when technologically dynamic industries are promoted more strongly in endogenous growth models (ibid).

Empirical studies spanning the 1870-1913 period have analyzed the connections between average measures of protection and economic growth (O'Rourke, 2000; Vamvakidis, 2002; Clemens and Williamson, 2004b; Schularick and Solomou, 2011, Jacks, 2013). A more extensive literature addresses this issue for recent decades.[14] While early studies (O'Rourke, 2000; Clemens and Williamson, 2004b) found that the overall relationship between tariffs and growth was positive for the late nineteenth century, increasingly the evidence suggests that this relationship is "complex, time-varying and may display significant heterogeneity" (Schularick and Solomou, 2011, p. 35). Lehmann and O'Rourke (2011) build on this research by exploring the connections between various types of tariffs – agricultural, industrial, or revenue (luxury goods) – based on the premise that different countries imported different commodities, and that average tariff rates hide important differences across sectors.

These studies use panel data to analyze broad trends across countries. In contrast, Lampe and Sharp (2013) use time series methods to explore the connections between changes in tariff rates and economic growth on a country-by-country basis, addressing the importance of cross-country heterogeneity as highlighted by Schularick and Solomou (2011). In contrast to earlier panel data studies, Lampe and Sharp (2013) find that while

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[12]E.g., for Republicans in the United States.

[13]Disentangling the stated goal of promoting national prosperity from unstated goals of aiding specific interest groups through tariff policies is difficult (Stern, 1971, p. viii; Bent, 2015a).

[14]There are many overviews of this literature available. Rodríguez and Rodrik (2000) is a useful, if slightly dated, starting point. Schularick and Solomou (2011) present a more recent discussion of this literature, covering both historical and more recent periods.

the relationship between tariffs and income differed by country, for most countries the overall relationship between tariffs and income was negative. Other research has focused on individual countries, such as a recent study of turn of the century Switzerland. For the Swiss case, Charles (2017) finds that "moderate and selective" protectionism from 1886-1913 "Granger-causes" increased exports from new industries.

Supporting the use of such case studies is Irwin's (2002b) argument that cross-country analyses of tariffs and growth have significant limitations. Irwin argues that for cross-country studies focused on this period, results showing positive correlation between high tariffs and high growth can be driven by countries such as Argentina and Canada, which had economies based on export crops rather than import-substitution industrialization. Irwin concludes that "[r]ather than higher tariffs causing higher growth, the relationship could be spurious: land-abundant countries relied on customs duties to raise government revenue and also enjoyed favorable growth prospects, with little link between the two" (Irwin, 2002b, p. 169). This is a useful critique of the existing literature, and one that I address in another paper, employing detailed case studies to complement cross-country empirical analyses. Also, it is important to note that by focusing here on post-crisis periods, I do not address long-run trends, but rather look more narrowly at the short-run impact of tariff shocks in the context of post-crisis economic downturns.

The goal of this paper is not to make new claims about the overall connections between trade openness and economic growth across this whole period, whether mostly positive, negative, or heterogeneous in different countries. Instead I address the observation that this relationship could be time-varying (Schularick and Solomou, 2011), which, I argue, is especially important to recognize with regard to how tariff policy impacted economies in the aftermath of financial crises.

A final question about tariffs is whether tariff rate changes can be accurately described as exogenous shocks. Terms of trade shocks, for example, can occur when a natural disaster significantly impacts the price of an export commodity. In contrast, tariff changes are more likely to be anticipated, as they are determined politically (Williamson, 2006, p. 199). Still, the empirical literature on trade restrictions accounts for tariff "shocks" as well as gradual changes in tariff rates (Auernheimer and George, 1997; Malakellis, 1998). Sometimes governments deliberately phase in tariffs gradually in order to reduce the shock effect (Irwin, 2014, p. 8). While some tariff policy changes are anticipated and/or gradual, treating tariffs changes as shocks is common practice in the empirical trade literature (Lanclos and Hertel, 1995; Spearot, 2016).

4   Data and framework

The main variables used in this study are terms of trade, tariff rates, and GDP estimates covering 35 countries for the years 1870-1913. The terms of trade data come from Blattman, Hwang, and Williamson's (2007) database[15] and the tariff rate data are from Clemens and Williamson (2004b). Terms of trade is the ratio of export to import prices, and tariff rates are calculated as total government revenue from imports over the value of imports to that country in that year. The GDP series from the Blattman et al. database are mostly from Maddison (1995) but are supplemented with other data series when available.

The other main variables of interest are financial crisis indicators. For this time period, the available measures of financial crises are binary variables, equaling one if a crisis occurred in a particular country in a given year, and zero otherwise. There are data for banking crises (Reinhart and Rogoff, 2009b), currency crises (Bordo and Meissner, 2011), and sovereign defaults (Suter, 1990) (see table A.1 in the data appendix).[16] For the sovereign default data, I focus on the first year of default periods in order to isolate the onset of an actual crisis rather than accounting for prolonged default episodes. In order to have a sufficiently large sample of recovery periods, I focus on recoveries from each of these crisis types together. That is, I code the crisis data as an encompassing measure of whether any type of crisis – banking, currency, or default – occurred in a country-year observation, and then test how terms of trade and tariff shocks impacted GDP in those post-crisis periods.[17]

Previous studies of the relationship between terms of trade measures and economic growth use five- or ten-year averages in order to account for long-run trends (Hadass and Williamson, 2003; Blattman, Hwang, and Williamson, 2007). The same is true for studies of connections between tariff rates and GDP growth over this period (Lehmann and O'Rourke, 2011; O'Rourke, 2000; Lampe and Sharpe, 2013). In contrast, I am interested in the short-run impact of terms of trade and tariff shocks specifically in post-crisis contexts. I thus use annual data. There are shortcomings to this approach, due to the imprecision of the data. The export and import data that are used to construct the terms of trade ratio are difficult to find for all countries and years in this sample.

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[15]The terms of trade data are constructed by Blattman et al. (2007, p. 163) from commodity price series. I am grateful to Jeffrey Williamson for sharing an updated version of this database with me (September 2016).

[16]The currency crisis data begin in 1880. An updated version of Suter's book was published in English in 1992.

[17]In the robustness section I focus on specific types of crises separately.

The tariff data face similar limitations. When interpolation was used to fill in gaps in these data series, this could smooth over more volatile annual variation.[18] Still, there are enough recovery episodes in enough countries in this sample that such instances do not undermine the overall empirical results.

The empirical analysis below focuses on the five-year period after a financial crisis. This timeframe was selected in order to cover both the immediate aftermath of crises and the chances for renewed economic growth as economies began to recover from crises. Extending the timeframe further than five years out from a crisis would move toward the types of long-run studies of terms of trade and economic growth that have already been undertaken (e.g. Blattman et al., 2007). The goal of this analysis is more narrow, asking how terms of trade and tariff movements impacted economies specifically as they recovered from financial crises. The definition of recoveries from financial crises is essentially uniform across the existing literature. Bordo and Meissner (2016, pp. 40-41), for example, define recovery as "the number of years until the level of real GDP per capita attains the prior peak it reached." Such peak-to-trough-to-peak frameworks are also adopted by Reinhart and Rogoff (2014), Bivens (2016), and others. In their study of recoveries from 100 banking crises, Reinhart and Rogoff (2014) measure the peaks, troughs, and first years that exceed the prior peak in their GDP per capita data. They calculate the years to full level recovery (the number of years from peak to new peak) for each of the 100 crises in their sample.[19] For the years 1870-1915 there were 18 crisis periods, which averaged 4.94 years peak-to-peak.[20]

A final point about the sample used in this analysis concerns the distinction between "core" and "peripheral" countries. There are terms of trade, GDP, and financial crisis data available for Britain, France, and Germany, which I designate as core countries. I exclude these countries from this sample, in order to focus on peripheral countries, or what today might be called "developing" economies. Blattman et al. (2007) also include Austria-Hungary and the United States in their subsample of core countries, but their analysis extends through 1939. For much of my sample period, the United States was a net capital importer, making it more similar in that regard to Argentina than to Britain, for example. Another factor that influences the core versus periphery distinction

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[18]See the original papers for which these data were developed in order to see the details of when and how interpolation was used in constructing the data: Clemens and Williamson (2004b); Blattman et al. (2007).

[19]Gadea, Gómez-Loscos, and Pérez-Quirós (2017) propose new measures of recoveries, looking at short-run (first few quarters), medium-run, and long-run features of recoveries separately.

[20]This excludes three extreme outliers: cases in Australia, Brazil, and Uruguay over this period where the peak-to-peak cycle lasted an average of 20 years.

for Blattman et al. (2007) is whether an economy was large enough to influence global prices for a particular commodity, and whether a country exported manufactures. The United States poses a problem on both these counts, so it is excluded from some of the econometric tests below to check that it is not unduly influencing the main results.

5 Empirical analysis

5.1 General trends

Before econometrically testing for the relationship between terms of trade and tariff shocks and economic growth, the general trends for these variables are presented in table 1.

Table 1: Changes in terms of trade and tariffs, 1870-1913

Variable	1870-1913	Pre-crisis	Post-crisis
GDP	36.05	61.05	47.94
Δ GDP	0.82	2.13	0.96
Terms of trade	112.61	113.71	111.06
Δ Terms of trade	0.03	0.58	0.44
Tariff	16.55	18.17	19.83
Δ Tariff	0.05	-0.10	-0.02

Note: The first column shows the average value of each variable over the entire sample period (1870-1913), the second column shows the average value over the five years leading up to crises, and the third column shows the average value over the five years after a crisis. The GDP data are in million 1990 dollars. Beneath the main row for each variable is the average annual change over each period.
Sources: See text.

GDP declines substantially after a crisis, both in levels and rates. The GDP data also suggest a boom-bust pattern, with higher than average growth before crises, followed by lower than average growth. The same is true for terms of trade, except the change in terms of trade over post-crisis periods is higher than the change in terms of trade over the whole sample. But this fits with the overall trajectory of the average terms of trade index across these countries from 1870-1913, because even though the index rose in the

1880s and fell in the 1890s, these peaks and troughs average out to little change over the whole period. In contrast, tariff rates were on average higher in post-crisis periods compared to pre-crisis periods and the sample average.

5.2   Econometric methodology

I use Jordà's (2005) local projection method to study the reaction of economies to terms of trade and tariff rate shocks. This technique has been used to address similar questions in recent research. Owyang, Ramey, and Zubairy (2013), for example, use this method to study government spending multipliers. Rocha and Solomou (2015) and Romer and Romer (2016) use variations of this estimation method to study the impact that financial crises had on economic output. While Lampe and Sharp's (2013) analysis has the benefit of looking at individual countries' experiences, the focus on recovery periods in this paper is worth studying at the more aggregate level of peripheral countries in a panel setting, to see if there are cross-country trends for these factors (terms of trade and tariffs) in this context (post-crisis periods).

Jordà's (2005) local projection method generates an impulse response of GDP to terms of trade and tariff shocks, based on the coefficient estimates from a sequence of regressions. The baseline version of the model used here is based on the Ramey and Zubairy (2014), Rocha and Solomou (2015), and Romer and Romer (2016) adaptations of Jordà's method:

$$\frac{y_{i,t+h}}{y_{i,t-1}} = \beta_1^h \text{ToT}_{i,t} + \beta_2^h \text{Tariff}_{i,t} + \beta_3^h \text{Post*ToT}_{i,t} + \beta_4^h \text{Post*Tariff}_{i,t} + \theta \text{D}_{i,t-1} + e_{i,t+h} \quad (1)$$

where the dependent variable is cumulative GDP growth, ToT is terms of trade, and $Tariff$ is the tariff rate. The terms of trade and tariff rate variables are also interacted with the post-crisis dummy ($Post$, which indicates if it is years one through five after a financial crisis). D is the lagged dependent variable.[21] The t subscript denotes time, while h represents the amount of time (up to five years) after t in that particular regression.

The interaction terms are used to generate the impulse responses for the post-crisis periods. This isolates the impact that the variables of interest (terms of trade or tariffs) had on economic growth specifically during the aftermath of financial crises.

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[21]One lag is used, based on standard lag specification tests.

5.3 Results and discussion

Plotting the coefficient estimates from equation 1 shows the impulse response of GDP to a shock in the independent variable of interest – terms of trade and tariffs – for post-crisis periods, along with ninety-five percent confidence intervals.

A terms of trade shock (figure 1, panel a) has a negative impact on GDP both over the whole sample, as well as during post-crisis periods specifically. In contrast, tariff shocks (figure 1, panel b) have a positive (but not significant) impact on GDP over the whole period, and a consistently positive and significant impact on GDP during post-crisis periods.

Figure 1: Response of real GDP to terms of trade and tariff shocks
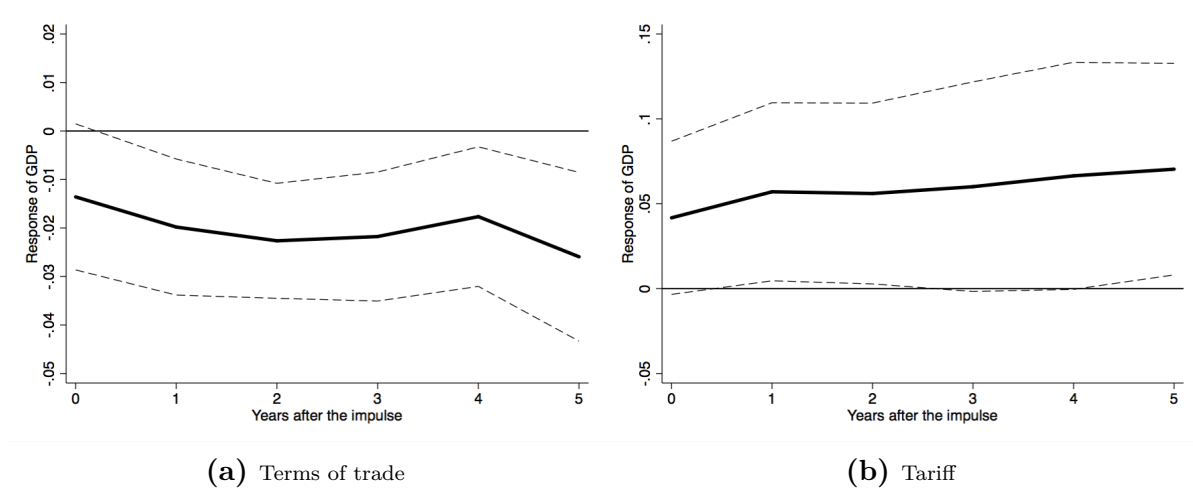
(a) Terms of trade   **(b)** Tariff

Notes: The graphs show the impulse response function of real GDP to an impulse of terms of trade from estimating equation 1, along with 95 percent confidence bands.

Interpreting the results when interaction terms are included is easier after the marginal effects are calculated (see table 2). The trends in the marginal effects are the same as for the estimates from the baseline model – terms of trade have an increasingly negative association with GDP, while tariffs have an increasingly positive relationship. One year out from the beginning of a crisis, for example, a terms of trade shock has a negative 4.9 percent impact on output growth, and a tariff shock has a positive 6.0 percent impact on output growth. The further away from the crisis the harder it is to draw a direct connection between the independent and dependent variables, but the signs of the overall trends for each variable are strongly suggestive.

Table 2: Marginal effects

Variable	Post-crisis year	Marginal effect	Standard error
Terms of trade	0	-0.022	0.012
	1	-0.049	0.019
	2	-0.074	0.024
	3	-0.096	0.031
	4	-0.113	0.038
	5	-0.148	0.048
Tariff	0	0.028	0.020
	1	0.060	0.042
	2	0.092	0.062
	3	0.126	0.084
	4	0.169	0.107
	5	0.219	0.131

These results address competing claims in the literature on recovery from financial crises at the turn of the twentieth century. Earlier studies emphasized the role that export prices played in propelling economic recoveries over this period. White (1939) and Ford (1956), for example, analyze specific crises and argue that depressed commodity prices prolonged depressions and increasing prices helped economies recover. And in the turn-of-the-century United States, protectionists argued that higher tariff rates would help stabilize the economy after panics. The analysis in this paper addresses these claims in an international context over the whole 1870-1913 period.

The terms of trade results align with the finding from Blattman et al. (2007) that the terms of trade variable itself was not significantly associated with GDP growth over this period. When they break down terms of trade into separate growth and volatility measures they find a significant negative relationship between terms of trade volatility and GDP growth, but no significant relationship between terms of trade growth and GDP. Those measures of growth and volatility are derived from data spanning the whole sample, which would not make sense in the short-run context of post-crisis periods. The impulse responses show the impact of a shock in the first and subsequent years after a crisis. These post-crisis terms of trade results complement the findings of Blattman et al., by suggesting that a terms of trade shock had a significant negative effect on GDP after a financial crisis, corresponding to their negative finding for terms of trade volatility overall.

For tariff shocks, in this short-run context of post-crisis periods it is important to use annual data because big shifts in the data (such as the sharp increase in tariff rates in the

United States after 1897) are less obvious when the data is averaged. Local projection results for the whole sample[22] show that tariff shocks did not have significant impacts on GDP growth. However, when the sample is limited to the aftermath of financial crises (figure 1, panel *b*), higher tariff rates positively impact GDP. This highlights the importance of not simply taking consecutive five-year averages of the data, but rather focusing on the context in which tariff rate changes occurred (e.g., whether or not there was a financial crisis). This does not necessarily call into the question the results others have found for this period, but it does highlight the particularly strong impact that tariff policies could have in the wake of financial crises.

These findings also align with theories that suggest the short-term impact of tariffs would be positive (by protecting domestic industry and encouraging investment) but that the long-run impact would be negative (as firms grew complacent and inefficient as a result of being protected from competition, for example, and/or through deadweight losses).[23] Additionally, there are particular short-run concerns that are heightened in the aftermath of crises, namely the desire to promote stability and manage expectations by assuring firms and investors that the government has a plan for what trade policies will be implemented. As the mayor of New York City complained in 1897, it is "constant and repeated changes [in tariff rates] that unsettle the business of this country" ("Dingley Bill Discussed"). Tariff policies were one of the few options available for governments in these developing countries to intervene in their economies at this time, and this evidence suggests that such policies were associated with renewed output growth after financial crises.

Looking in greater depth at the factors driving these results, it is also important to acknowledge that different countries produced different types of exports. Terms of trade fluctuations could thus impact certain sub-samples of countries differently based on whether they were exporting particular commodities at a given time. Countries' resources and commodity production could be determined by factors such as geography, chance, or institutions, and later stages of development could be impacted by which commodities were produced in a country. Diaz-Alejandro (1984) dubs this the "commodity lottery" (see also Blattman et al. 2007, p. 160). Similarly, Lewis (1978a, pp. 14-20) highlights the differences between the terms of trade in temperate versus tropical countries, focusing on price differences between temperate and tropical commodities,

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[22]These graphs are omitted here but are available upon request.

[23]See Bastiat (2007 [1850], pp. 24-29) for a useful historical illustration of the longer-run negative effects of tariffs.

and how they influenced wages, immigration, and overall development.[24]

To test whether Lewis's distinction between temperate and tropical countries made a difference for how countries recovered from financial crises, the same local projection method is used as for the baseline analysis (equation 1), but the sample is divided into temperate and tropical countries, trying several variations of these categories. One broad way to categorize the countries in this sample is a temperate versus tropical distinction based on whether countries were temperate grain producers or producers of tropical commodities (Lewis, 1978b, p. 188; Lewis, 1978a, p. 14; these distinctions generally fit with standard geographical definitions of temperate versus tropical regions, based on distance from the equator). Under these guidelines, the temperate countries include those in the European periphery, regions of recent settlement, and the Southern Cone countries of South America: Argentina, Australia, Austria-Hungary, Canada, Chile, Denmark, Greece, Italy, New Zealand, Norway, Portugal, Russia, Serbia, Spain, Sweden, Turkey, United States, Uruguay. I classify the rest of the countries in the sample as tropical: Brazil, Burma, Ceylon, China, Colombia, Cuba, Egypt, India, Indonesia, Japan, Mexico, Peru, Philippines, Thailand. The results of this analysis are shown in figure 2.[25]

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[24]An important factor in Lewis's analysis is the temperate versus tropical country wage differential. Temperate countries produced commodities which had prices high enough to attract European immigrants, versus tropical countries which produced commodities whose production paid low wages, due to low productivity in domestic agriculture (Lewis, 1978a, p. 14).

[25]Average tariff and terms of trade estimates for each group (tropical and temperate countries) are shown in figure A.1 in the data appendix. Lewis (1978a, p. 14) differentiates more narrowly among "new countries of temperate settlement" (Argentina, Australia, Canada, Chile, New Zealand, and South Africa), the United States, and other (tropical) destinations for European migrants. Lewis (1978b, p. 160) explicitly identifies "India, Ceylon, Indonesia, Egypt, Brazil, and other Latin American countries" as being tropical.

Figure 2: Temperate vs. tropical countries: local projection results
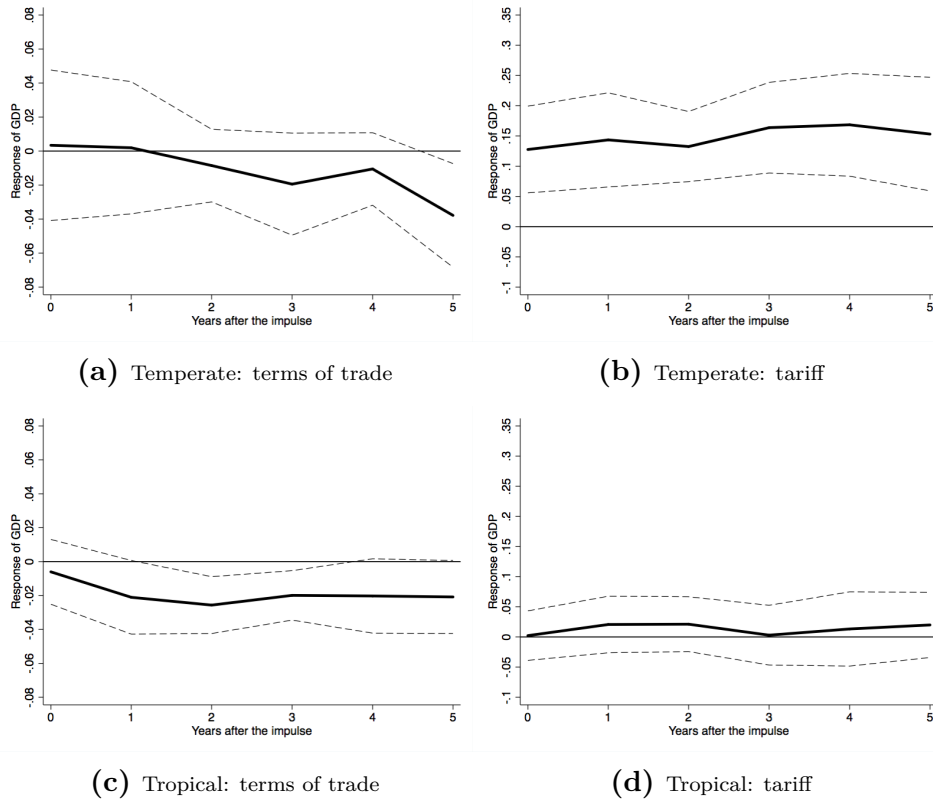
(a) Temperate: terms of trade

(b) Temperate: tariff

(c) Tropical: terms of trade

(d) Tropical: tariff

Notes: The graphs show the impulse response function of real GDP to an impulse of terms of trade and tariffs from estimating equation 1, along with ninety-five percent confidence bands. See text for definitions of temperate and tropical countries.

These results suggest that there were significant differences between these two groups of countries. Panels *a* and *b* indicate that terms of trade shocks did not impact temperate countries' output after financial crises, but tariff shocks did have a positive and significant effect. In contrast, for tropical countries (panels *c* and *d*) tariff shocks did not have a significant effect, but terms of trade shocks had a negative association with growth during post-crisis periods.[26] Each of these outcomes is reasonable, since the temperate economies include more developed economies and governments which could implement potentially more effective policy responses to crises, and more volatile terms of trade

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[26]Both temperate and tropical countries had increases in average tariff rates during post-crisis periods compared to pre-crisis periods. Average pre-crisis tariff rates in tropical economies were 18.19, and average post-crisis tariff rates in those economies were 21.15. For temperate economies, the pre- and post-crisis average tariff rates were 18.16 and 19.05, respectively.

could have a more significant negative impact on less developed tropical countries.[27]

Jacks's (2013) real commodity price data also align with these trends, as tropical commodities (such as cocoa and coffee) often experienced more booms and busts than temperate commodities (such as wheat and wool) over this period. Price indices for select commodities are shown in figure 3. Both sets of price series are volatile, but temperate commodity prices follow a loosely U-shaped trajectory centered around a trough in the mid-1890s (panel *a*). In contrast, for tropical commodities, cocoa and sugar exhibit an overall declining trend, while coffee prices had more sustained highs and lows. The generally falling commodity prices in tropical countries (at least for sugar and cocoa) fit with Lewis's thesis as well as with the econometric findings above, highlighting how negative terms of trade trends had more of an adverse effect on economic growth in tropical countries than in temperate countries. Declining terms of trade in tropical countries over this period also can be seen in figure A.1 (panel *c*) in the data appendix.

Figure 3: Commodity prices: temperate vs. tropical, 1870-1913

(a) Temperate   **(b)** Tropical
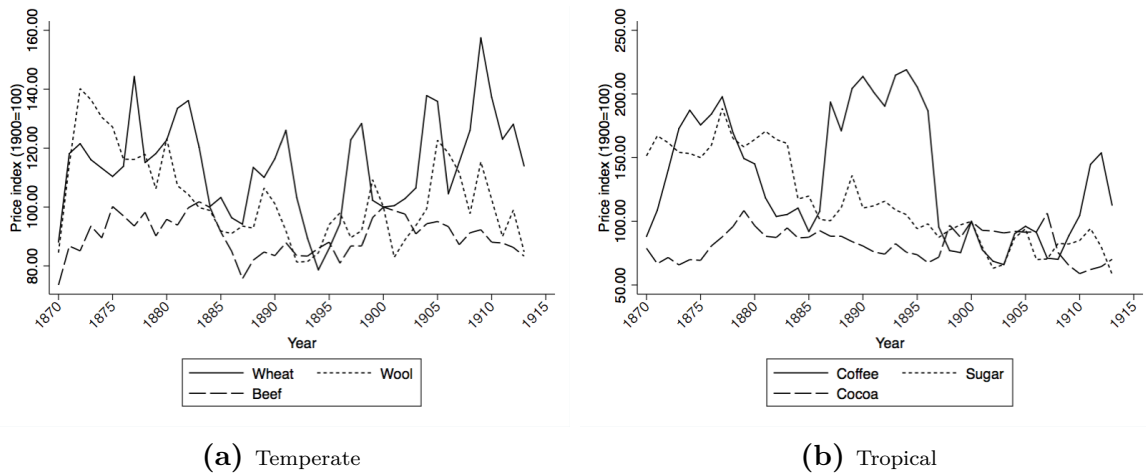
Notes: These figures show the changes in selected commodity prices from Jacks (2013). Panel (a) shows commodities from generally temperate countries, while panel (b) shows commodities from tropical countries.

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[27]Colonial status is not taken directly into account in this analysis, but it influenced which crops were grown and what trade policies were implemented, among other factors affecting many of the economies in this sample (Clemens and Williamson, 2002). But Williamson (2006, p. 204) argues that "while colonial tariff policy did indeed mimic that of their masters, local conditions mattered as well."

5.4 Robustness

One potential issue with this empirical strategy is that the results found for the post-crisis periods could simply be a consequence of looking at five-year periods rather than all the years in the sample. To be assured that this is not the case, I run the main regressions again but replace the post-crisis indicator in equation 1 with a dummy variable for the five years *preceding* a crisis. The results are for the pre-crisis period are very different, with the tariff interaction results negative and insignificant. This suggests that the relationships between terms of trade and output growth and between tariffs and output growth were different during the pre- versus post-crisis periods, with tariffs having an especially strong impact on crises in the post-crisis periods.

Similarly, it is important to determine whether the choice of five-year post crisis periods (rather than a longer time frame) is driving the results. Figure 4 shows the results from equation 1 when post-crisis periods have a ten-year span rather than a five-year span. These results confirm that a five-year horizon is a reasonable focus for this analysis. After about five years, the results for both terms or trade and tariff shocks are no longer statistically significant (at the 95 percent confidence level). This also suggests that these shocks had the strongest impact in the short-to-medium term after a crisis, and that the effect dissipated as more time passed.

Figure 4: Response of real GDP to terms of trade and tariffs (10-year post crisis periods).
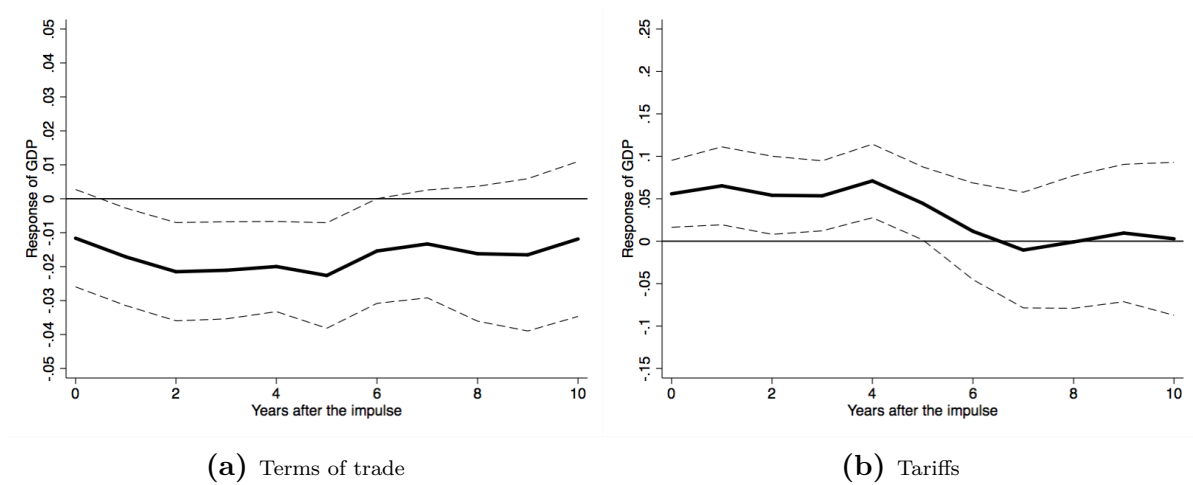
(a) Terms of trade

(b) Tariffs

Notes: The graphs show the impulse response function of real GDP to an impulse of terms of trade or tariff rates from estimating equation 1, along with 95 percent confidence bands, for 10-year post-crisis periods rather than the 5-year post-crisis periods used in the baseline specification.

Ideally this analysis would take into account the duration and severity of crises. Not all crises have the same impact; sometimes GDP per capita is higher the year after a financial crisis, and sometimes it remains depressed for years. Reinhart and Rogoff (2014) account for these differences by developing a "crisis severity index." Their index is calculated as:
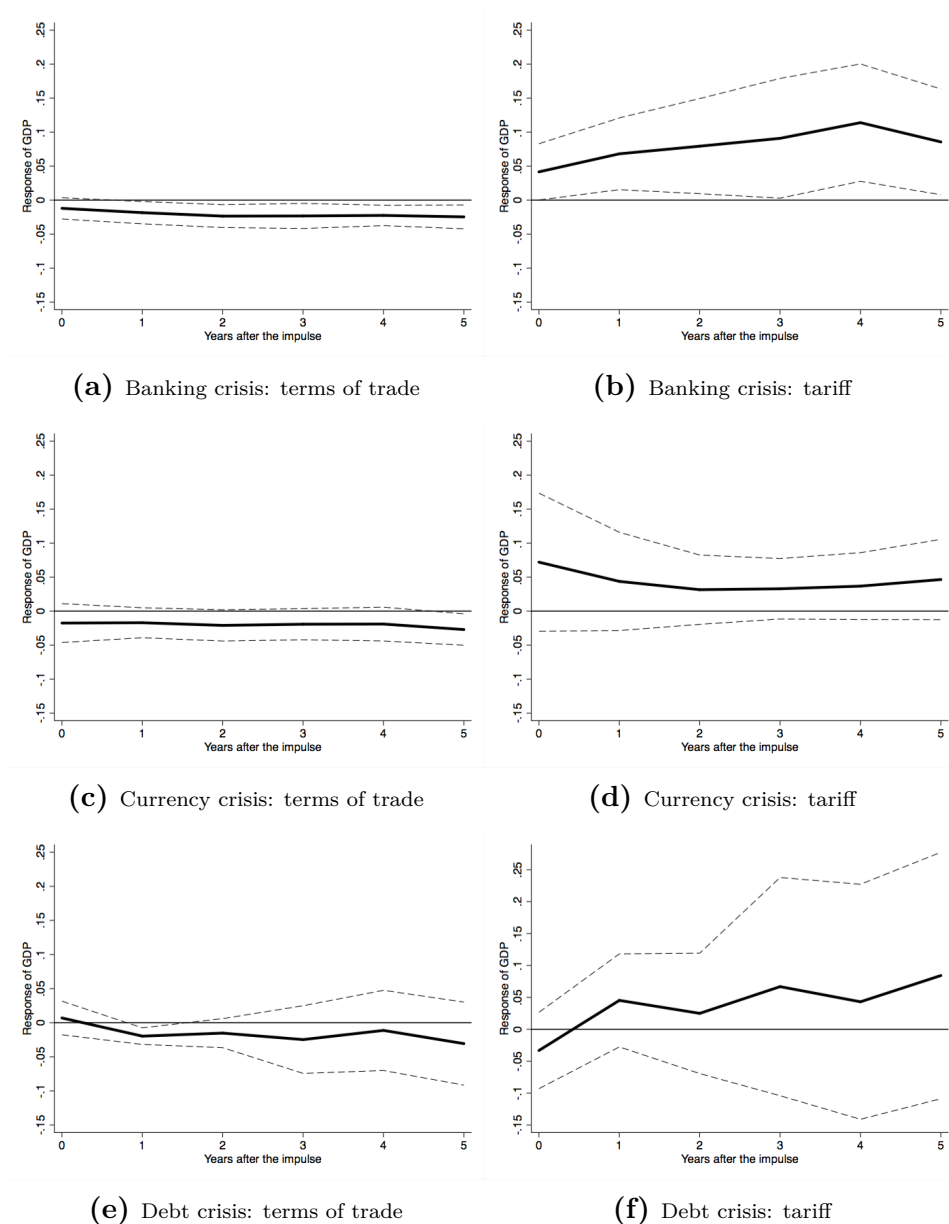
$$Severity\ index_i = -(Peak\ to\ trough\ \%\ change)\ + $$
$$(Number\ of\ years\ from\ peak\ to\ recovery\ of\ prior\ peak_i).\quad (2)$$

That index accounts for 100 crisis episodes, each denoted by the i subscript in equation 2, over more than 150 years and a wide range of countries. Combined with peak-to-trough and peak-to-recovery timelines and an indicator of whether or not there was a double-dip, the index offers a way to compare recovery periods across different countries and times. Incorporating such an index into the analysis in this paper would be useful because, for example, it would provide information about whether terms of trade or tariff shocks coincided with mild or severe crises. Unfortunately, the sample in this paper is too limited to undertake that kind of analysis. There are 37 banking banking crises in my sample, and in only 12 of those cases did post-crisis GDP per capita decrease for one or more years. In future research, extended series of terms of trade and tariff rate data could be combined with Reinhart and Rogoff's (2014) crisis severity index to conduct a longer-run study of interactions between those variables.

I also account for the possibility that recoveries could be different depending on the type of crisis that an economy experienced. The financial crisis measure used in the baseline regressions is a binary indicator of whether any type of crisis occurred, and that measure is based on individual dummy variables for banking, currency, or sovereign debt crises. Figure 5 shows the same type of impulse responses as the baseline analysis but differentiated based on which particular type of crisis occurred. It is clear that banking crises are driving the main results, with terms of trade having a negative and significant impact on GDP after crises, and tariffs having a bigger, positive impact. [28]

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[28]The currency crisis data only cover the years 1880-1913, so to be sure that the 1870s data were not driving the banking crisis results I ran these regressions again for banking crises only during the 1880-1913 period. The main results still came through.

Figure 5: Banking, currency, and sovereign debt crises separately

(a) Banking crisis: terms of trade

(b) Banking crisis: tariff

(c) Currency crisis: terms of trade

(d) Currency crisis: tariff

(e) Debt crisis: terms of trade

(f) Debt crisis: tariff

Notes: The graphs show the impulse response function of real GDP to an impulse of terms of trade from estimating equation 1, along with 95 percent confidence bands. The first pair of results (*a* and *b*) are for the recovery period after a banking crisis, the second pair of results (*c* and *d*) are for the recovery period after a currency crisis, and the third pair of results (*e* and *f*) are for the period following the onset of a sovereign default period.

I also run different econometric tests to be assured that the results are not unduly driven by the choice of model. The OLS regressions in table 3 test the general relationship between five-year averages of GDP per capita growth and the independent variables: terms of trade and tariffs. Using five-year averages of the data follows the growth regression conventions employed by Blattman et al. (2007). It also addresses the concern that the annual historical data are imperfect (e.g., with interpolation used to estimate data for missing years), so averaging captures broader trends. These regressions also include standard growth regression variables such as initial per capita income, human capital, and population growth measures, along with country and period fixed effects. Using GDP per capita data here also serves as a robustness check for the baseline analysis which used GDP data, by accounting for the population of each country.

Table 3: OLS regressions

Dependent variable: GDP per capita growth	(1) (Whole)	(2) (Post-crisis)	(3) (Whole)	(4) (Post-crisis)	(5) (Whole)	(6) (Post-crisis)
Period:						
Terms of trade	0.0000 (0.0001)	0.0001 (0.0003)			0.0001 (0.0001)	0.0001 (0.0003)
Terms of trade volatility			-0.0006 (0.0005)	-0.0013 (0.0013)		
Terms of trade growth			0.0940* (0.0486)	0.2395 (0.1933)		
Tariff	0.0003 (0.0003)	0.0013* (0.0007)	0.0003 (0.0003)	0.0014** (0.0007)	0.0004 (0.0003)	0.0015* (0.0008)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Period fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	315	80	315	80	288	70
Number of countries	35	30	35	30	32	27

Notes: Robust standard errors in parentheses. Independent variables are lagged. Constant term is included in the regressions but omitted from the table for brevity. Controls include logged initial GDP per capita, the proportion of the population with primary schooling, and population growth. * p<0.10, ** p<0.05, *** p<0.01.

Each pair of regressions in table 3 follows the same pattern: the first column of each pair (1, 3, and 5) includes the whole sample period, and the second column of each pair (2, 4, and 6) is limited to five-year periods that had 60 percent or more of the years

during that period identified as post-crisis years.[29] Regressions 1 and 2 use the same terms of trade and tariff measures as the baseline regressions, and the results suggest a positive and significant association between tariffs and growth during post-crisis periods. Regressions 3 and 4 follow Blattman et al. (2007) by using a Hodrick–Prescott filter to isolate the volatility and growth components of terms of trade. Blattman et al. find terms of trade volatility be negatively and significantly associated with economic growth in a similar set of countries from 1870-1939. They also find that while terms of trade growth was mostly positively associated with crises, that relationship was not statistically significant. Regressions 3 and 4 in table 3 control for terms of trade volatility and growth separately, following the analysis of Blattman et al., in case that is an important part of explaining growth in post-crisis periods in particular. But that does not appear to be the case. The results in regression 4 suggest that tariffs are still more significantly associated with post-crisis growth than is any measure of terms of trade changes.

Regressions 5 and 6 are the same as 1 and 2 but exclude Austria-Hungary, Italy, and the United States, which Blattman et al. identify as part of the industrial core. The results are essentially unchanged, suggesting that the particular core-periphery distinction adopted in this analysis is not what is driving the results. It could also be important to differentiate between countries that were price-makers versus price-takers in global commodity markets. Blattman et al. (2007, p. 169) identify Australia, Brazil, Chile, China, India, the Philippines, and Russia as either (1) producing more than five percent of world exports, or (2) accounting for more than one-third of the global exports of a particular commodity. When these countries are dropped from the baseline OLS specifications (that used in columns 1 and 2 of table 3) the signs and magnitudes of the post-crisis results are essentially unchanged but the tariff result is no longer significant. But the sample size in that case is down to 64 observations and 24 groups, which could be driving that particular result.

Treatment effect estimators offer another method for measuring the connections between tariff changes and GDP growth during post-crisis periods. These methods have been used in recent macroeconomic research to assess the impact that fiscal policy, for

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[29]Just as with the baseline regressions, a post-crisis period is defined as the five years after the beginning of a financial crisis. The data used in the table 3 regressions are averaged in five-year intervals. The selected inclusion criterion in regressions 2, 4, and 6 is that 60 percent of the years in each five-year period must be post-crisis years. If that criterion is set at 100 percent the sample is too small to undertake this analysis. If it is set at 80 percent the signs of the results are the same, but the tariff result is not significant.

example, has on output (Jordà and Taylor, 2016). They help to address the potential shortcomings of non-randomized treatments in non-experimental data. I use a standard inverse probability weighting (IPW) estimator to address the concern that tariff increases after financial crises were not random, as some trade policy changes were likely to be expected based on economic and political developments in a given country.[30] Tariff "booms" are calculated as a one standard deviation change in the tariff volatility measure after applying a Hodrick–Prescott filter to the tariff data.[31] This serves as the treatment in the IPW framework, which is based on two components, an output model and a treatment model. The main outcome variable (in the output model of the IPW estimation) is logged GDP growth, and the treatment model has the tariff boom measure as the outcome variable, along with the same controls as the OLS regressions in table 3 (terms of trade, logged initial GDP, a human capital measure, and population growth). Also included is a measure of whether a country had relatively high or low tariffs on average. This is measured as whether the average tariff rate in a country was above or below 13 percent from 1870-1913 (about half of the countries in the sample fall into each group). This accounts for the possibility that countries with higher tariff rates are already open to implementing protectionist policies and would be more likely to enact such measures as a policy tool in the face of economic downturns.[32] The results from the IPW analysis are shown in table 4.

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[30]I use the probit version of the IPW estimator.

[31]With the smoothing parameter set at 100, following Mendoza and Terrones (2012, p. 7). Jacks (2013, p. 14) employs a similar approach.

[32]The IPW results are essentially the same whether or not these controls are included.

Table 4: Inverse probability weighting estimations

Dependent variable:
Logged GDP growth

Period:	(1) (Whole)	(2) (Non-post-crisis)	(3) (Post-crisis)
ATE:	-.0055* (0.0029)	-.0093*** (0.0030)	.0154** (0.0075)
ATE as %:	-.2021** (0.1023)	-.3364*** (0.1010)	.6608* (0.3624)
Controls	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. Controls include logged initial GDP per capita, the proportion of the population with primary schooling, population growth, and a dummy variable for countries that had high average tariff rates from 1870-1913. "ATE" is the average treatment effect (of a tariff "boom" on GDP), and in the second row of the body of the table this is expressed as a percentage. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

The first row in table 4 shows the average treatment effect (ATE) for the whole period (column 1), the whole period less recovery periods (column 2), and recovery periods (column 3). The ATE estimates the average of the differences between the GDP growth rates when each country experiences a tariff boom and when no country experiences a tariff boom. In the subsequent row (ATE as %) this is expressed as a percentage of the mean growth rate that would occur if no country experienced a tariff boom, making interpretation more straightforward. These results indicate that over the whole period a tariff boom reduced the growth rate by about 20.2 percent (column 1). Excluding post-banking-crisis periods that figure is negative 33.6 percent (column 2). In contrast, if a tariff boom occurred in the aftermath of a banking crisis, the growth rate was about two-thirds higher than if no tariff increase of that magnitude had occurred. These findings are consistent with the results from the local projection analysis above.

6   Channel: capital inflows

It would be informative to test how shocks to terms of trade and tariff rates in the aftermath of financial crises impacted the investment decisions of agents in peripheral economies. This could be a channel through which these factors impacted recoveries from crises, as changes in terms of trade or tariff rates could make investment more (or less) attractive. Unfortunately, investment data are not available for this sample of countries

for 1870-1913.[33] An imperfect substitute is data on capital inflows from Britain (Stone, 1999).[34] Using these data, Blattman, Hwang, and Williamson (2007) find the same negative relationship between British capital exports and terms of trade volatility as they find for the connection between GDP growth and terms of trade volatility, suggesting that countries with more volatile terms of trade were less attractive to foreign investors. Also, using annual data and analyzing the "pull factors" that attracted capital flows to peripheral economies over this period, Clemens and Williamson (2004a) find a positive and significant association between tariff rates and capital inflows, indicating that more protectionist trade regimes were attractive to foreign investors. For terms of trade their results are also positive, but smaller in magnitude and not statistically significant.

I undertook a similar analysis using the framework developed in this paper, with capital inflows as the dependent variable (instead of GDP) in equation 1. The results were inconclusive, but generally indicate that terms of trade or tariff shocks were not significantly associated with capital inflows during post-crisis periods. Over five-year post-crisis periods, the coefficient estimates for tariffs were generally of greater magnitude than the result for terms of trade, and the tariff results mostly had the expected positive signs.[35] However, the results were not consistently statistically significant. I also disaggregated the capital inflow data into capital flows to governments and capitals flows to private sector industries, and again the results suggest that there is generally no significant relationship between terms of trade or tariffs and capital inflows (of either type – government or private sector) during the five-year post-crisis periods. In the longer run, capital inflows have been shown to be positively associated with output growth (Bordo and Meissner, 2011). In contrast, the general trends of my findings suggest that capital flows were not a major factor contributing to recoveries from financial crises over this period.

A limitation of my analysis is that foreign capital inflows only account for a fraction of investment in these peripheral economies at this time. Domestic investment was more important for much of the business activity that was undertaken by farms and small firms. A one-off commodity price boom could provide farmers, for example, with extra money to invest in new equipment and expanded production or land acquisition (White,

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[33]Data on investment rates are available for later periods, such as from 1960 onward as presented in the Penn World Tables, but unfortunately no comparable cross-country data exist for the pre-1913 period. The Jordà-Schularick-Taylor *Macrohistory Database* has investment-to-GDP ratios for only a subsample of the countries covered here.

[34]Data on capital exports from Germany and France are available from Esteves (2007) and Esteves (2011, 2015), respectively, but only from the early 1880s onward.

[35]The figures showing these local projection results are omitted here but are available upon request.

1982, pp. 80-81). Similarly, firms could finance investment through retained earnings. These avenues of domestic investment are not accounted for in the international capital flow data. The Jordà-Schularick-Taylor *Macrohistory Database* has investment-to-GDP ratios for nine of the countries in this sample. Local projections (equation 1) using this subsample and the investment-to-GDP ratio as the dependent variable yield generally insignificant results. The same is the case when a measure of domestic investment is generated by multiplying the investment-to-GDP ratio by GDP. But this subsample is very limited, and mostly focuses on the richer/bigger economies from the sample, so I do not place too much emphasis on these results. They do not convincingly rule out the possibility that domestic investment increased as a result of terms of trade or tariff rate changes.

7 Conclusion

This paper addresses two related literatures that look at (1) the connection between terms of trade movements and economic growth, and (2) tariff rates and economic growth. While the relationship between terms of trade and GDP growth has been clearly demonstrated (Blattman et al., 2007), finding a connection, if any, between tariffs and growth has been more contentious. By focusing specifically on post-crisis periods, the question addressed in this paper is more narrow. For post-crisis periods, I find a negative impact of terms of trade shocks, but a positive impact for tariff shocks. This suggests that national governments played a more active role in shaping economic outcomes than has often been appreciated for this period.

This period has traditionally been characterized as being the historical zenith of laissez-faire capitalism. Focusing on the role of national governments in these economies at this time challenges this narrative. A growing literature is developing this line of research, finding more evidence for government actions in economies at the dawn of the progressive era.[36] The debates in the United States after the 1893 panic are a prominent example of these trends.[37] A Democratic presidency overlapped with the mid-1890s depression and the implementation of more liberalized trade policies from 1894-97. This

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[36]See Palen (2015, p. 161) for a summary of the literature that frames the turn of the twentieth century as being laissez-faire, as well as the research that refutes that characterization. See also Pollard (1981, p. 252) for a discussion of government interference in trade from 1870-1914.

[37]A case study of this episode is developed in another chapter of my dissertation. See also Bent (2015a), where I look more closely at the intentions behind trade policy at this time, especially in the context of financial crises.

allowed protectionist-minded Republicans to assert that free trade policies prolonged the depression. They argued that protectionist policies would renew confidence in domestic industry and balance the federal budget through increased tariff revenues. After the Republican William McKinley assumed the presidency in 1897, tariff rates were raised to some of the highest levels ever seen in the United States. In that same year, the U.S. economy also began to recover from the mid-1890s depression (the most severe depression through that point in U.S. history). This allowed protectionists to claim that their higher tariff rates were indeed effective for spurring output growth in the face of a deep economic downturn.

The validity of those claims is explored elsewhere (Bent 2015a), but this episode offers an example of the debates that were taking place at this time over the appropriate role for policy action to deal with crises. This historical antecedent to the well-studied policy actions taken during the Great Depression[38] is under-appreciated, and shapes a developing view of the "laisse-faire" turn of the twentieth century as actually having more government involvement in shaping economies after financial crises than has traditionally been recognized.

This paper presents a broad cross-country analysis of the interactions between governments and markets. Its findings suggest that trade policy changes were more important than terms of trade shocks for explaining renewed economic growth after financial crises during the globally-integrated 1870-1913 period. As Irwin (2002b) has demonstrated, case studies of this issue can highlight shortcomings in broader cross-country econometric studies. The third chapter of my dissertation will provide case studies of the United States and Argentina in the 1890s. Further research can look more closely at other individual cases when terms of trade movements and tariff rate changes occurred after crises. Future research can also explore the investment channel in greater depth as more data becomes available for measuring domestic investment over this period.

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[38]The literature on policy actions to combat the Great Depression is extensive and has been evolving since the 1930s. A relatively recent overview of this literature is presented in Crafts and Fearon (2013).

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# A Data appendix

Table A.1: Countries and crises, 1880-1913

Country	Default	Currency Crisis	Banking Crisis
Argentina	1890-93	1885, 1890, 1908	1885, 1890-91
Australia			1893
Austria			1873
Brazil	1898	1889, 1898	1890-92, 1897-98, 1900-01
Canada		1891, 1893, 1908	1906, 1908, 1912
Ceylon		1894	
Chile	1880-83	1887, 1889, 1898	1898, 1907
China		1892-93, 1901	1883
Colombia	1880-96, 1900-04	1906, 1909	
Cuba		1898	
Denmark			1885, 1902, 1907
Egypt		1900	1907
France		1888	1882, 1889, 1904, 1907
Germany		1893, 1907	1880, 1891, 1901
Greece	1894-97	1885	
India		1894	1908
Italy		1894, 1908	1887, 1891, 1893, 1907
Japan		1900, 1904, 1908	1882-85, 1901, 1907
Mexico	1880-85		1883, 1893, 1908, 1913
New Zealand		1903	
Norway			1898
Peru	1880-89	1893	
Portugal	1892-1901	1891	1890-91
Russia		1891	1896
Serbia	1895		
Spain			
Sweden			1897, 1907
Turkey	1880-81	1886, 1903	
Uruguay	1891		1893, 1898
United States		1891	1884, 1890, 1907

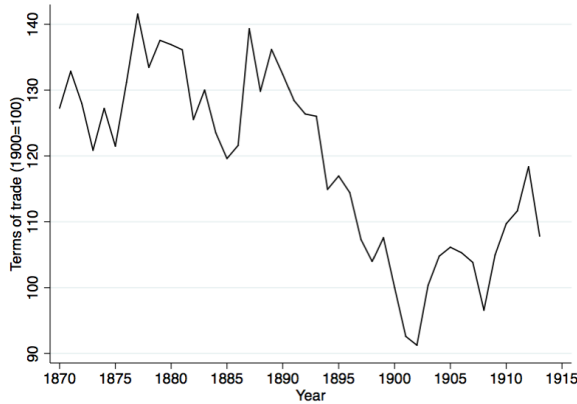Sources: Reinhart and Rogoff (2009b); Bordo and Meissner (2007); Esteves (2007b); Suter (1990).

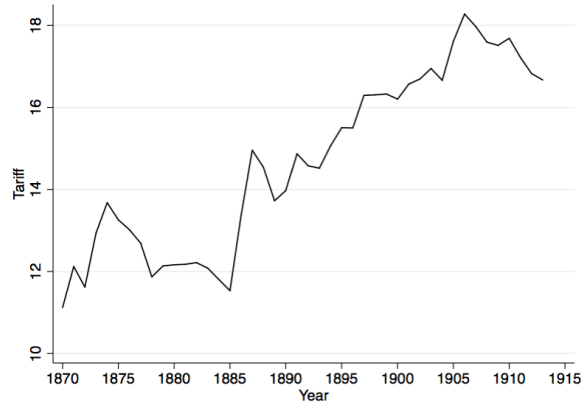**Figure A.1:** Temperate vs. tropical countries: data averages
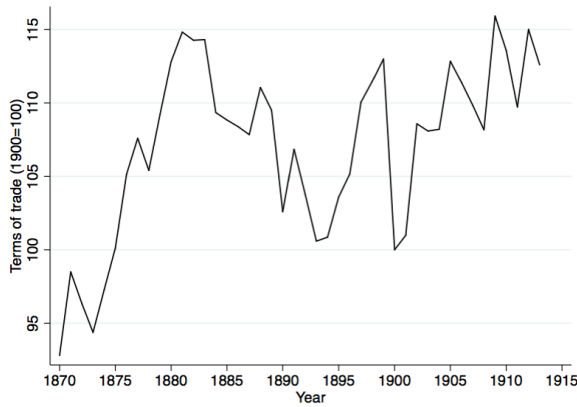
(a) Temperate: terms of trade
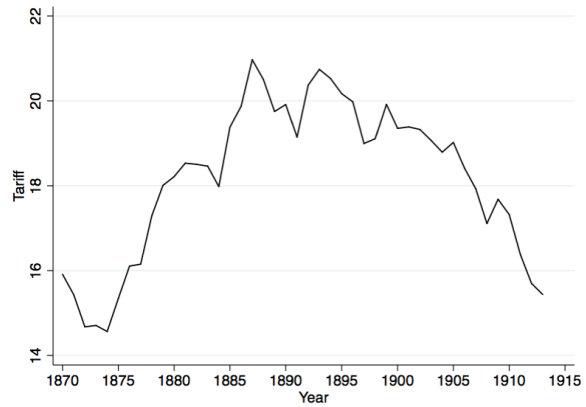
(b) Temperate: tariff

(c) Tropical: terms of trade

(d) Tropical: tariff

Notes: The graphs show the average terms of trade and tariff measures across the temperate and tropical sub-samples of countries respectively, from 1870-1913. The temperate countries include those in the European periphery, regions of recent settlement, and the Southern Cone countries of South America: Argentina, Australia, Austria-Hungary, Canada, Chile, Denmark, Greece, Italy, New Zealand, Norway, Portugal, Russia, Serbia, Spain, Sweden, United States, Uruguay. The rest of the countries in the sample are classified as tropical: Brazil, Burma, Ceylon, China, Colombia, Cuba, Egypt, India, Indonesia, Japan, Mexico, Peru, Philippines, Thailand, Turkey.