

# Are Financial Crises Contagious?

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## Abstract

An examination of the historical record reveals distinct cycles in financial crises. There are periods characterized by a 'contagion' effect, where financial crises swiftly traverse borders and sectors. Conversely, there are also periods typified by 'containment,' where the financial system adopts measures to prevent the spread of crises, keeping markets and nations separate. This paper contends that these cycles in financial crises are intricately linked to shifts in the international power structure.

The historical record of the international power structure over the past 350 years discloses cycles featuring periods of a dominant nation-state exercising leadership and alternating with 'struggle for power' phases when no single state holds dominance, and many nations share similar levels of power.

The aim of this paper is to establish the correlation between these two distinct cycles: hegemony is associated with 'isolation' periods, while 'contagion' tends to occur during phases of 'struggle for power'. In consequence, during periods of 'struggle for power', financial contagion tends to occur, whereas hegemony fosters containment.

The second part of this paper delves into an explanation of this correlation, grounded in theories concerning a common good of the foreign reserves. This paper will show that in periods of crisis, containment results from the implementation of international global policies that prevent the propagation of crises in periods of an hegemonic power.

**Keywords:** Financial Crises, Contagion, Struggle for Power, Hegemony, National Sovereignty, International Power structure, Foreign reserves.

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## I. Introduction

The literature on regulation highlights a pendulum dynamic between deregulation and financial crises in the Western world. Periodically, public discontent with excessive bureaucracy prompts government initiatives to deregulate, often leading to financial crises. Subsequently, in response to the crises, governments implement stricter regulations, prompting further public backlash, thus perpetuating the cycle.

However, another pendulum dynamic exists in relation to financial crises, characterized by contagion and heavily influenced by the international power structure. This paper aims to examine the cycles inherent in financial crises. Over the past 350 years, historical data reveals alternating periods marked by "contagion," where crises swiftly propagate across countries and sectors, and "isolation," where policies are implemented to prevent crisis spread, maintaining separation between markets and nations.

This paper argues that these financial crisis cycles are intricately linked to shifts in the international power structure. Historical analysis spanning the past 350 years indicates alternating cycles wherein a single nation-state assumes dominance and leadership, followed by periods of "struggle for power," characterized by the absence of a dominant state and a more balanced distribution of power among nations.

The purpose of this paper is to show that these two cycles are correlated: Hegemony is related to periods of 'isolation', while 'contagion' occurs in periods of balance of power. The main element which leads to a different outcome depending on the international system is the common good effect of international foreign reserves.

First, the paper presents data on these both cycles. Some could claim that the existence of hegemonic power which is correlated with free trade periods would lead to a period of contagion. This paper will show that it has the opposite effect. It is periods of 'struggle for power' which lead to financial contagion, while hegemony leads to 'isolation'. This paper will show that periods of containment of a crisis are taking place since the propagation of crisis is circumvented by international global policy.

The second part of the paper is devoted to explaining this correlation. The arguments are based on theories related to 'power and cooperation in regulation'. These arguments serve to provide theoretical underpinnings for the observed relationship between international power dynamics and the contagion or isolation of financial crises.

About the international system, the historical record of the last 350 years reveals recurring cycles during which certain nation-states rise to dominance and assume

leadership roles. In the 18<sup>th</sup> century, the Dutch is a dominant country, although not an hegemonic power. However, from 1850 to 1910, the UK is the dominant country in the world. It is *Pax Britannica*; the UK has leapfrogged the Dutch and is the hegemonic power. This period is not only a period of peace, but also a period of increasing free trade. This paper will show that this is a period of 'isolation' of financial crisis, in which policy of the hegemonic power permits to circumvent big financial crisis. In periods of hegemony, there is room for coordination.

Between 1910 and 1945, the world faces a period of balance of power/struggle for power, where many countries fight for reaching hegemony, while there is a bloody war all over the globe, but also a trade war between the power nations. This paper shows that it is a period of contagion in financial crisis. A small crisis in one country is propagating to other countries, and there is no general policy to contain the crisis.

After 1945, the world faces the rise of a new hegemonic power – the US. From 1945 to 20210, it is a period of *Pax Americana*, and the US has leapfrogged the UK. From 1945 until 2010, the US is the hegemonic power of the world. It is a period of peace, and also of free trade (see Figures 1-3). This paper will show that this is a period of isolation of crisis, in which the propagation of crisis is circumvented by international policy.

This paper analyzes why in times of hegemonic power, contagion is contained, while in periods of balance of power the crisis spreads from one country to another.

Hegemony exhibits characteristics akin to those of a "lender of last resort" due to the externalities associated with its foreign reserves, which transform into a common good during hegemonic periods. This understanding permeates global perceptions, ensuring that crises in one region or country do not trigger contagion effects elsewhere. This common good effect bears semblance to the principle of "too big to fail" observed in banking systems, wherein the presence of large banks enhances stability, as they are less susceptible to destabilization by individual crises.<sup>1</sup> Similarly, hegemonic powers

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<sup>1</sup> The term "too big to fail" carries a negative connotation, implying that excessive size can incentivize irresponsible behavior. For instance, large financial institutions may engage in unethical practices knowing that their failure could have severe repercussions for the public. However, this aspect is beyond the scope of this paper.

In this paper, we examine the positive aspects of "bigness" and "too big to fail." When an entity, such as a bank or a neighbor, is significant in size, it can contribute to the safety and security of its surroundings. This concept illustrates the external benefits of hegemony, wherein the collective or common good is enhanced.

exert a stabilizing influence, fostering periods of crisis isolation through the implementation of international policies aimed at curtailing crisis propagation.

Conversely, during periods of struggle for power, the absence of such a common good exposes countries to the contagion effect, leading to heightened frequency of financial crises, as depicted in Figure 4. Essentially, this paper posits that during hegemonic eras, a singular entity stands prepared to assist other countries, whereas in times of power struggle, the prevailing ethos revolves around conflict, sovereignty, and nationalism, fostering susceptibility to speculative attacks. Consequently, each country guards its reserves jealously, rendering it more vulnerable to such attacks. This dynamic is evidenced by the frequency of contagion during periods of balance of power, such as between wars, where intervention for the collective good is scarce.

The subsequent section delineates a taxonomy of financial crises, followed by the presentation of a concise model in the third part. Finally, Part IV offers concluding remarks.

## **II. A Taxonomy of Financial Crises**

Research on financial crises has revealed a multitude of cases, each seemingly unique. The sheer volume of these cases often leads to the feeling that one "can't see the forest through the trees."

On one hand, exhaustive studies delve into various types of crises, offering comprehensive insights into the data landscape. A seminal work in this domain is Carmen Reinhart and Kenneth Rogoff's book titled 'This Time is Different: Eight Centuries of Financial Folly.' From this body of research, we can construct a taxonomy of financial crises, encompassing sovereign debt default; crises within the banking and private sectors; and currency-related issues. Let us start by examining debt default.

### **1. Excessive debt accumulation by government**

These crises manifest as government debt defaults, where concerns arise regarding the government's ability to repay its debts. Countries accumulate significant debt due to prolonged deficits. We categorize these crises based on the nature of the debt, distinguishing between debt denominated in the country's own currency (1A) and debt denominated in foreign currency (1B).

A seminal paper on this topic is Krugman (2014), where he scrutinizes cases like Greece and compares them to historical examples like France in the 1920s. His central argument posits that a loss of foreign confidence triggers a sudden stop—a rapid decline in the capital account. The adjustment mechanism crucially depends on the currency regime. Under fixed exchange rates, interest rates must rise to stimulate

import compression, while under floating rates, adjustment occurs through currency depreciation and export growth.

Krugman contends that crises akin to those experienced by Greece are improbable for countries like the United States or the United Kingdom. He concludes that the distinction between short-term and long-term interest rates does not seem to offer any pathway through which a nation with an independent currency could experience output decline due to reduced foreign willingness to hold its debt.

About France in 1920, he wrote: "So what do we learn from France in the 1920s? Here we had a country that, if you believed currently dominant rhetoric, should have been primed for catastrophe: Public debt was over 200 percent of GDP, the political system was dysfunctional, and policymakers had little credibility. What actually happened, however, was a sharp fall in the franc, substantial inflation, but nothing like a Greek-style crisis, and in fact a quite good performance in terms of real output. Nothing in that story validates the conventional wisdom. Fear of a Greek-style fiscal and financial crisis has loomed over much of our policy discourse over the past four years, and has played a significant role in shaping actual policy, constituting the principal argument for austerity in countries that don't face any current difficulties in borrowing. However, despite repeated warnings that crises of confidence are imminent in floating-rate debtors – mainly the United States, the United Kingdom, and Japan - these crises keep not happening. Part of the explanation for the failure of disaster to strike on schedule lies in the De-Grauwe point: countries that borrow in their own currencies are simply not vulnerable to the kind of self-fulfilling liquidity crises that have afflicted euro debtors."

## **2. Excessive debt accumulation by banks and corporations**

Gertler and Gilchrist (2018) conducted an analysis of bank runs and found that approximately 40% of financial crises stem from debt accumulation by commercial and investment banks. These crises can arise due to either liquidity issues (2A) or solvency problems (2B).

Liquidity problems may stem from various factors such as expectations, short-term policy errors, and particularly the absence of a lender of last resort. On the other hand, solvency issues arise from poor firm policies. While solvency problems could potentially be resolved through a buyback, sometimes bank runs exacerbate the crisis.

Which of these factors is more prevalent? In the post-World War II era leading up to the current crisis, there have been five severe bank crises (Spain 1977, Norway 1987, Finland 1991, Sweden 1991, Japan 1992) and thirteen milder bank-centered financial crises. This tally includes the 2008 crisis affecting the United States, United Kingdom,

Austria, Hungary, Iceland, and Ireland, alongside several episodes from the 1997-98 Asian crisis, Colombia 1998, and Argentina in 2001.

The third type of crises is the currency crises. Our following model focuses on this type of crises.

### **III. The model**

The objective of this model is to analyze the mechanisms underlying the spread of financial crises across countries. Specifically, our model centers on currency crises, characterized by countries experiencing dwindling foreign reserves.

The model comprises two fundamental components: a macro model of crisis and a micro model of individual optimization and national identity and sovereignty. The first segment elucidates how the foreign reserves of a hegemonic country influence the risk premium, thereby altering the exchange rate equilibrium and potentially averting reserve depletion and crisis.

In the second segment, we delve into how and why different phases of the international system give rise to varying risk premiums. We demonstrate that during periods of hegemony, the utility function of individuals within a nation-state differs from that during periods of struggle for power. Integrating both segments, we elucidate that financial crises exhibit distinct dynamics during hegemonic eras compared to periods of power struggle.

Our model asserts that during hegemonic periods, the contagion element is relatively subdued, whereas during periods of balance of power, it becomes pronounced. The framework also incorporates a snowball effect with an expectation dimension, further shaping crisis dynamics.

#### **A The macro model of balance of payment crises**

The model draws from established frameworks for exchange rate crises, as outlined by Krugman (1979), Flood and Garber (1984), and Obstfeld (1986). Our aim is to offer a simplified version to enhance tractability. Primarily, we rely on the monetary approach to the balance of payments, which can be expressed in a simple Mundell model. This streamlined approach allows for a more accessible analysis of the dynamics at play.

There are three main equations: 1. The equilibrium in the money equation (LM) such that supply of money equals the demand for money, which is a function of domestic interest rate,  $i$ , and output,  $Y$  (equation 1).

2. The interest rate parity equation (equation 2) means that due to perfect capital mobility, the domestic interest rate is equal to the foreign interest rate plus an expected devaluation, and since there is some imperfect asset substitutability, then we add a risk premium,  $\rho$ , which is function of the size of the debt of the country, its foreign reserves, and the externality of the international reserves of the hegemonic country (see next part).

3. The money supply, foreign reserves and internal money (domestic credit) are related by equation (3). In consequence foreign reserves, and changes in foreign reserves are given by equations (4) and (5).

Finally, based on the model presented in the next section, the risk premium is also a function of the international reserves of the hegemonic country,  $F^*$  (equations 6 and 7).

$$\frac{M^s}{P} = L(i, Y) \quad (1)$$

$$i = i^* + \frac{E(e_{t+1})}{e_t} + \rho \quad (2)$$

$$M^s = \mu(F^* + A) \quad (3)$$

$$F^* = \frac{M^s}{\mu} - A = \frac{PL(i, Y)}{\mu} - A \quad (4)$$

$$\Delta F^* = \frac{\Delta PL(i, Y)}{\mu} - \Delta A \quad (5)$$

$$\rho = \rho(B - A) + \gamma(crisis) \quad (\text{in case of power struggle}) \quad (6)$$

$$\rho = \rho(B + F^{h*} - A) + \gamma(crisis) \quad (\text{in case of hegemony}) \quad (7)$$

## B National identity, hegemonic power and foreign reserves

This segment of the model shows that during periods when there is a hegemonic power, the foreign reserves of the hegemonic country act as a common good, influencing the risk premium of other countries (as shown in equation 7). However, during periods of power struggle, each country retains its own foreign reserves, and the size of one country's foreign reserves does not create externalities for others.

In other words, during times when a single country holds hegemonic power due to its economic and military supremacy, it finds it optimal to intervene in foreign exchange markets, assisting other countries even at an economic cost. However, when countries are competing for power, this is not the case. Why?

## **B1. National identity**

This is because, during periods of hegemony, individuals' objective functions focus on consumption, as in the standard Samuelson model. However, during periods of power struggle, the values of national identity rise, causing countries to care not only about consumption utility but also about their relative power compared to other nations. Consequently, a country adopts different policies regarding foreign reserves during times of hegemony and during times of power struggle. The factors influencing these different policies include national identity, national sovereignty, and power.

In recent decades, sociology, along with behavioral economics, has gradually influenced economic theory. In 2000, Akerlof and Kranton introduced 'identity' as an element affecting economic choices. In social psychology, Tajfel developed the 'theory of social identity,' which posits that individuals have an inherent tendency to categorize themselves into one or more "in-groups," building a part of their identity based on group membership and enforcing boundaries with other groups.

Individuals care about consumption but also about common values. This concept is related to theories of social identity, which encompass the values of national identity. Social identity theory posits that a person's self-concept and self-esteem derive not only from personal identity, consumption, and accomplishments but also from the status and accomplishments of the groups to which they belong (Tajfel and Turner, 1979). Their experiments showed that humans have a need for 'us/them' distinctions.

A clear grouping is the nation itself, and national identity is one of the main groupings in human history. What are the 'markers' of a nation's social identity? According to Metzl (2019), the main elements defining a nation's identity are national sovereignty and power, which influence the sense of well-being of individuals within the nation.

Robert Reich, former Secretary of Labor from 1993 to 1997 in the cabinet of President Bill Clinton and professor at Harvard, asked his students to choose between two scenarios. Choice A: the US grows by 3% per year, and China grows by 4% per year. Choice B: the US grows by 1% per year, and China also grows by 1% per year. Approximately 80% of the students chose Choice B.

In 2019, while I was a visiting professor at Nanjing University, I asked 80 Chinese students in my class to choose between Choice A and Choice B, swapping the growth rates for China and the US. All the students chose the option of having less economic growth if it meant that the opponent (the US) would also have less growth. Some students even added, "We want to become the next superpower, even at the cost of lower growth."



What is the importance of belonging to a hegemon in the context of national identity? In the next section, we will develop the notions of hegemonic power and national sovereignty and relate them to foreign reserve policies.

## **B2. Hegemony, national sovereignty, and foreign reserves**

In the literature on hegemony, there is no clear definition of the elements that define it, and debates exist about whether Rome, Portugal, and Holland possessed hegemonic power. However, there is no debate that the two main hegemonies close to our period are Britain and the US. Britain held hegemonic power from 1815 to 1914 (from the Congress of Vienna to the start of the Great War), based on its industrial supremacy and railroads. The US has held hegemonic power from 1945 until 2010.

What are the effects of hegemony on individuals? In Brezis (2024a), I define the utility function of an individual, which takes into account relative power affecting national identity. Power is a means of maintaining sovereignty, winning wars, or deterring attacks. While debates over the definition and measurement of power are endless, most scholars of the "realist" school agree that economic and military factors are crucial. We thus begin with the premise that a nation's power depends on both its economic and military strength.

We define output as being allocated to consumption. We emphasize that the utility of a citizen is a function of their utility from consumption, as workers prioritize consumption. However, they also value national sovereignty and power, reflecting their social identity.

What is the definition of power (PW)? Power is a combination of economic and military strength. During periods of power struggle, each country strives to maintain its power relative to others. Since foreign reserves affect both economic and military power, no country will offer to protect another country with its own foreign reserves. Consequently, the risk premium is characterized by equation (6).

In periods of hegemony, the hegemonic country is not competing with others, as its economic and military power is significantly superior. Therefore, it focuses solely on the regular Samuelson function of consumption, making it advantageous to prevent financial crises. Citizens of the hegemonic country benefit from offering their foreign reserves during crises to prevent contagion. In this case, the risk premium follows equation (7), where it also depends on the foreign reserves of the hegemonic country,  $F^{h*}$ .

Recall that the risk premium is:

$$\rho = \rho(B - A) + \gamma(\text{crisis}) \quad (\text{in case of power struggle}) \quad (6)$$

$$\rho = \rho(B + F^{h*} - A) + \gamma(\text{crisis}) \quad (\text{in case of hegemony}) \quad (7)$$

Therefore, we get proposition 1.

### **Proposition 1**

*During periods of power struggle, a country's risk premium is characterized by Equation (6). Conversely, in periods of hegemonic power, the foreign reserves of the dominant country serve as a common good, influencing the risk premiums of other countries as described in Equation (7).*

The proof is presented the appendix (next version).

We now turn to analyze the dynamics of a financial crisis.

### **C. Dynamics of the model**

The model can now be implemented to analyze a balance of payment crisis. Let us assume that at time  $a$ , Country 1 experiences a significant shock in the demand for its exports, leading to a severe crisis due to the substantial loss of foreign reserves, as shown in Chart 1 (it is a simple chart presenting the equations (1)-(7) in a IS-LM-BP configuration).

The reduction in exports shifts the IS curve to the left, causing interest rates in Country 1 to decline. Consequently, according to Equation 6, foreign reserves leave the country (see Chart 2). Due to Equation 3, the money supply decreases, shifting the LM curve to the left. However, before reaching the equilibrium at time  $b$  (and returning to the same interest rate), the foreign reserves are depleted due to a higher return overseas. At this moment, the country has no choice but to increase the exchange rate from  $e_0$  to  $e_1$ , to halt the crisis.

What will happen to other countries now?

Let us focus on Country 2, presented in Chart 3. Since Country 1 experienced a financial crisis, other countries, with similar policies and pegged exchange rates will face an increase in the risk premium,  $\rho$ . Consequently, the BP curve shifts upward. and the LM curve shifts to the left (the public buys foreign reserves. In consequence, foreign reserves are depleted, and the economy moves towards point (b). Since there is no support from other countries, as shown in Chart 4, Country 2, which was initially in equilibrium, starts losing foreign reserves. Due to the crisis, there is a devaluation after the reserves are exhausted. Thus, we get Proposition 2.

### **Proposition 2**

*During periods of power struggle, the likelihood of contagion is elevated, resulting in multiple countries experiencing balance of payment crises and depleting their foreign reserves.*

Let us examine the scenario in which the hegemonic country assumes the role of providing a common good and acts as the lender of last resort for other nations. In this context, Country 2, which initially faces an increased risk premium due to contagion from Country 1, now after some loss in foreign reserves, experiences the help of the hegemonic country which leads to some increase in the amount of foreign reserves, and the risk premium which first increases returns to the previous level, owing to the stabilizing effect of the hegemonic country's reserves (see Equation 7). Consequently, the dynamics unfold as illustrated in Chart 5, despite a first loss of foreign reserves, the currency market comes back to equilibrium without a devaluation, preventing further contagion. Thus, we get Proposition 3.

### **Proposition 3**

*When one of the countries holds hegemonic power, its reserves assume the role of common good, and the hegemonic country assumes the role of the lender of last resort for the entire international system, effectively halting the contagion effect. As a consequence, most countries are shielded from financial crises.*

### **D. Conclusion of the model**

The dynamics of a balance of payment crises presented in this model rests on the occurrence of an idiosyncratic shock in one country, precipitating a balance of payments crisis in this country. Importantly, this paper does not scrutinize the policies or external shocks of the initial country but rather focuses on the contagion effect.

Proposition 2 highlights that during periods of power struggle, the likelihood of contagion is elevated, resulting in multiple countries experiencing balance of payment crises and depleting their foreign reserves.

Proposition 3 underscores that when one of the countries holds hegemonic power, its reserves assume the role of the lender of last resort for the entire international system, effectively halting the contagion effect. As a consequence, most countries are shielded from financial crises.

## **IV Conclusion**

One might assume that the existence of institutions like the IMF, the World Bank, the WTO, and the UN today would mitigate contagion compared to the 1930s. With these multilateral institutions in place, one could expect them to prevent crises in one part of the world from spreading globally.

However, the underlying message of this paper contradicts such optimistic thinking. We are currently witnessing a power struggle among nations, particularly between China, Russia, and the US. This struggle for national sovereignty is likely to result in the contagion of financial crises between countries.

The central thesis of this paper posits that during periods of hegemony, a hegemon's foreign reserves are considered a common good, recognized as such by nations. Conversely, during times of balance of power, each country tends towards a more mercantilist stance, disregarding the concept of a common good. Consequently, when a country faces a crisis, there is little assistance offered to others, thereby diminishing the notion of a common good and leading to additional countries experiencing crises. This paper fundamentally revolves around the concept of the common good associated with foreign reserves.

This paper delves into the propagation of financial crises, steering clear of analyzing the specific triggers for such crises in individual countries. In this regard, two distinct approaches to historical analysis emerge. The first revolves around examining macroeconomic factors within the country where the crisis originated.

Conversely, the second approach zooms in on the actions of bureaucrats, often elite figures. Rather than examining causality between elements, this approach scrutinizes decisions made by individuals. For instance, when examining the 2008-2009 crisis, rather than attributing it to regulation, one could trace its roots to the actions of a few financial magnates in the US, the five CEOs who testified before Congress that they did nothing wrong!!

However, such analysis related to the start of a crisis lies beyond the purview of this paper, which focuses instead on crisis dynamics, particularly the contagion effect. In this paper, I argue that during hegemonic periods, foreign reserves function as a common good, mitigating contagion, whereas during power struggles, emphasis on national sovereignty, identity, and mercantilist policies fosters contagion of financial crises.

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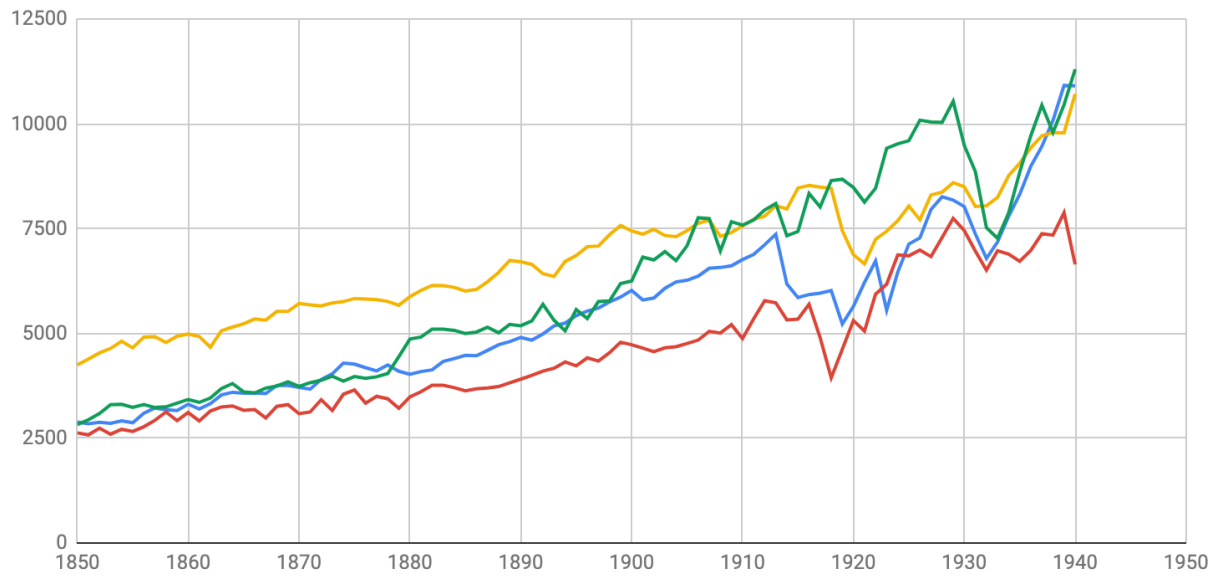
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## Figures and Charts

**Figure 1: Hegemony of Britain: 1850-1910 – GDP per capita**



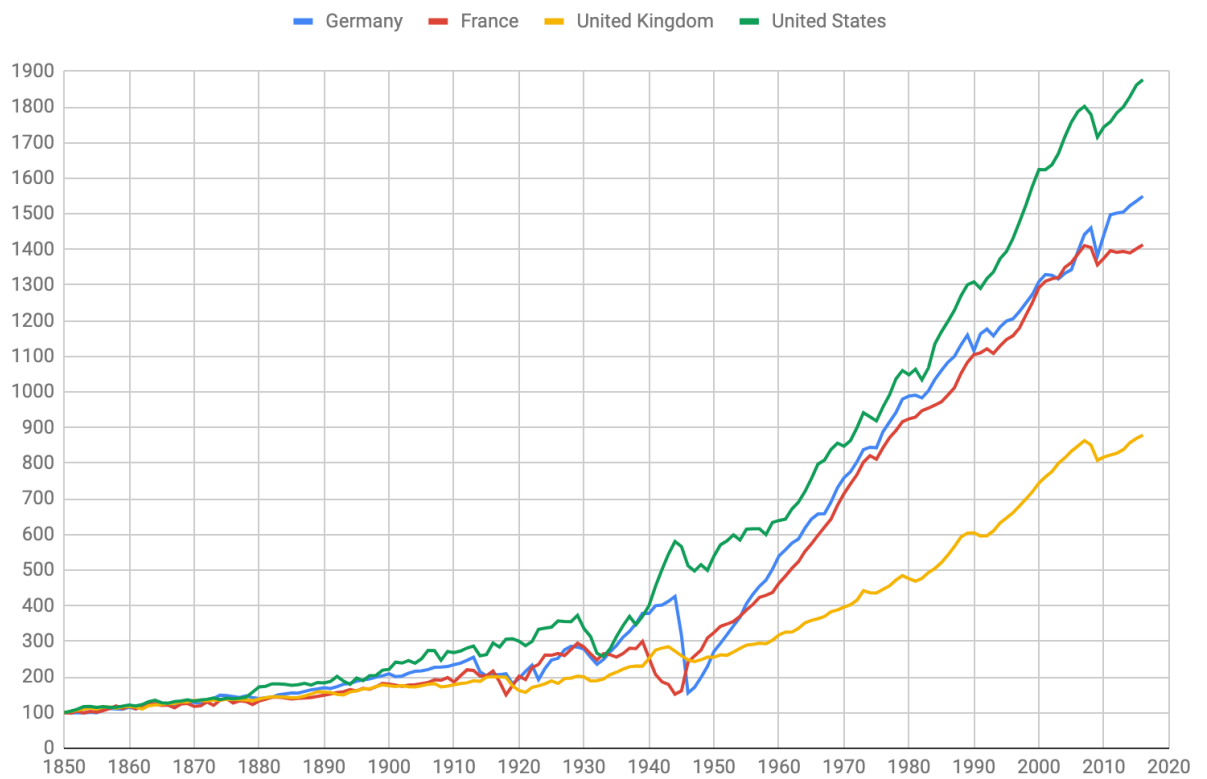
**Notes:** The GDP per capita index is set at 100 for 1850. The UK is in yellow, Germany is in blue, France in red, and the US is the green line.

**Source:** Maddison



**Figure 2: Hegemony of the US: 1945-2008.**

Maddison Data - GDP per capita, index set at 100 for 1850



**Figure 3. Balance of Power: 1910-1945.**

Maddison data - 1910- 1960

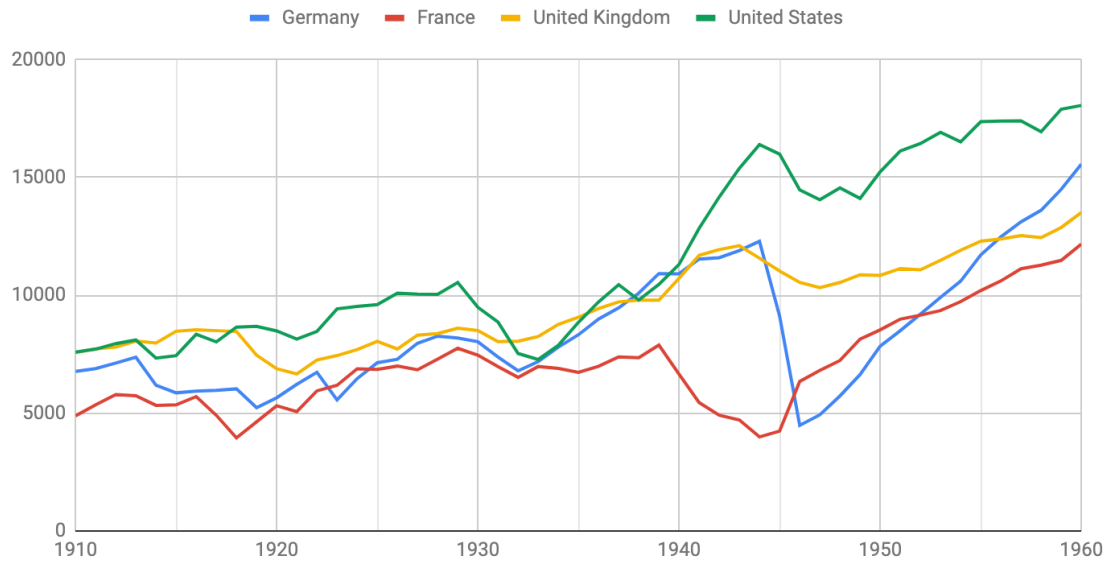
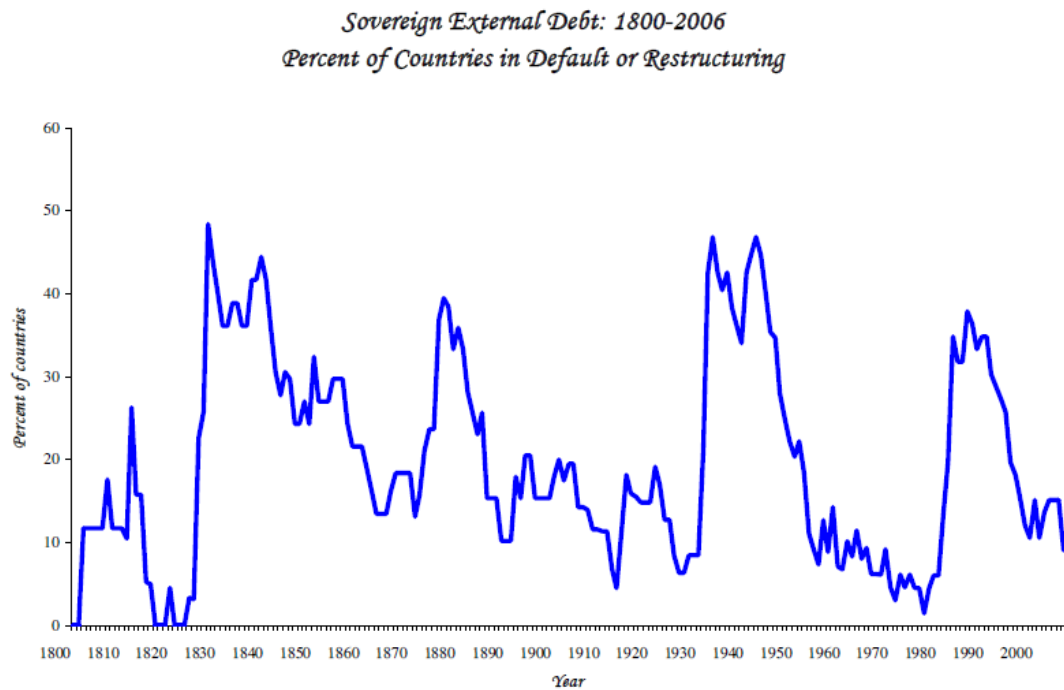
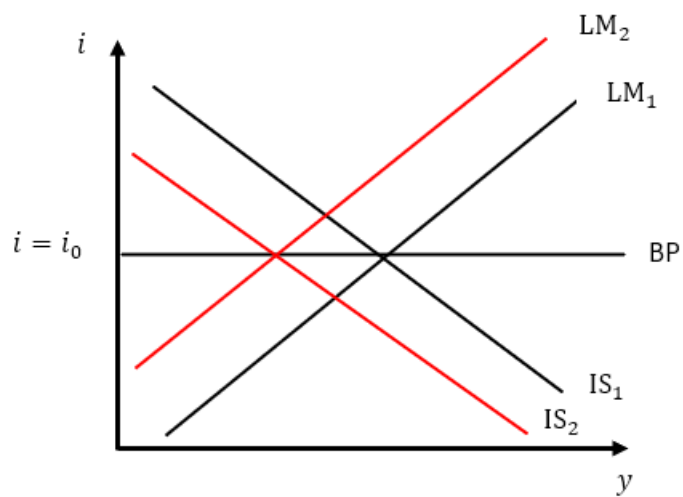


Figure 4. Cycles in the number of countries subject to financial crises



Source: Reinhart and Rogoff (2008a).

Chart 1: Country 1, Changes in demand for exports



Charts 2-3. Reduction in foreign reserves and devaluation

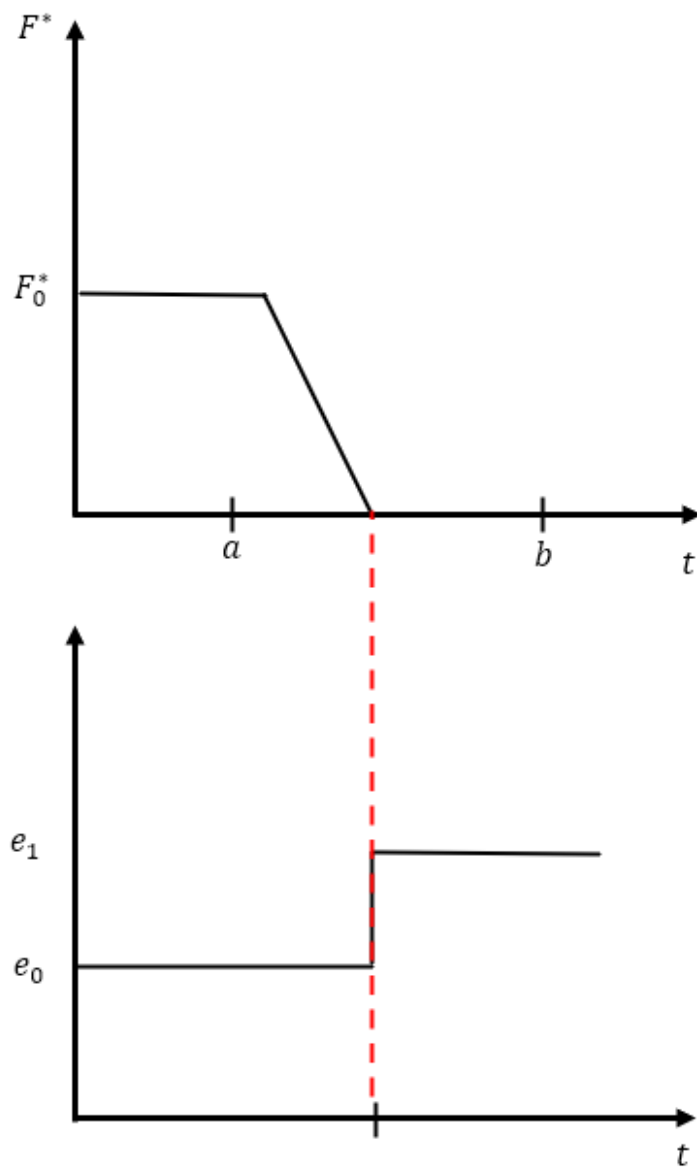
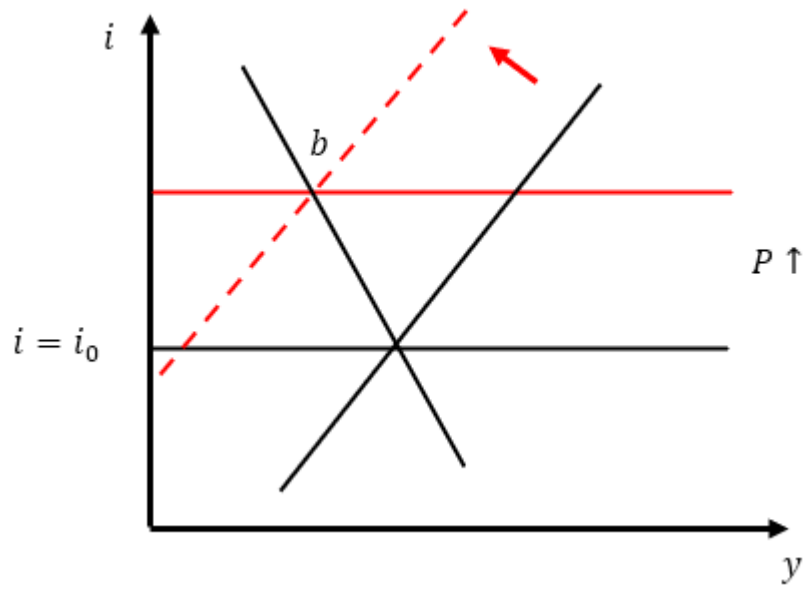
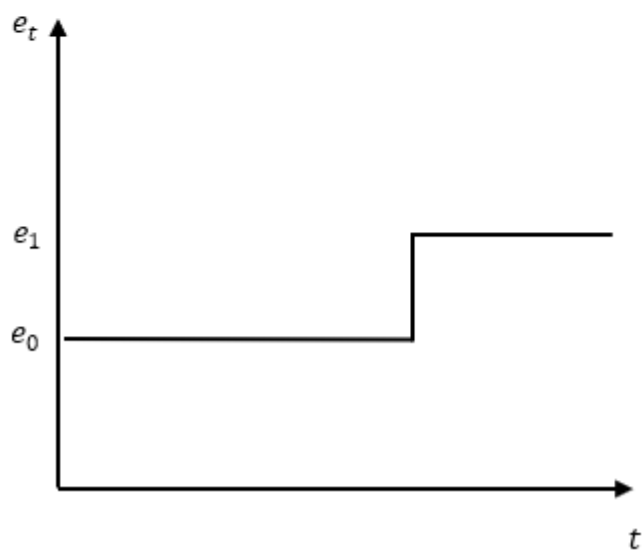
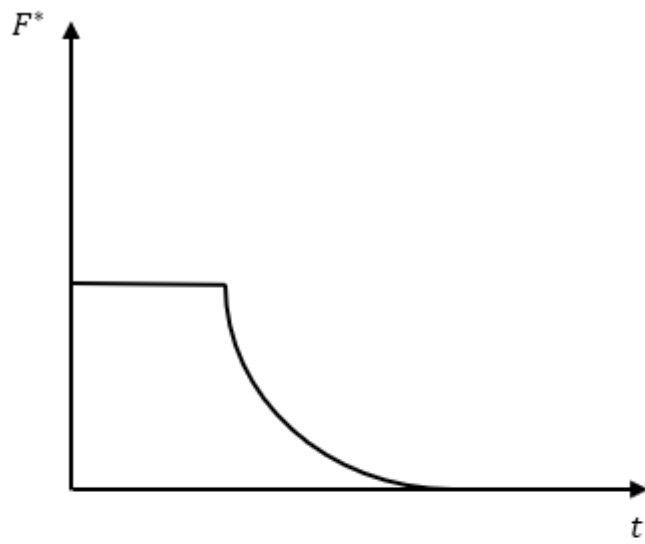


Chart 3: Country 2 – Case of struggle for power



Charts 4-5 Country 2- Case of struggle for power



Charts 6-7: Country 2 – In case of hegemony

