Demand-side shocks as contagion channels. The American "Panic of 1907" and its consequences for the German Empire.

Abstract

Research on how the crisis of 1907 spread from its country of origin – the United States - to other countries is mainly focused on monetary transmission channels, such as liquidity shortage and rising interest rates, which arose as part of the transmission of monetary policy under the gold standard system. In contrast, this paper outlines the economic consequences of the American financial crisis of 1907 for the German Empire, with an emphasis on real economy factors. It is shown that the economy of the German Empire was hit heavily in 1907, but neither a credit squeeze nor high interest rates were the ultimate causes. A decreasing domestic demand - due to an overheated real estate market -, and a severe setback of foreign trade led to an economic downturn. It seems that the predominant focus on monetary contagion channels in economic research lead to incomplete results. Even under a pegged exchange rate system – the classical period of the gold standard -, the real economy factors played a decisive role, and demand-side shocks could have led to severe economic turbulences with significant consequences for the affected countries.

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1. Introduction

In most people's perception, financial crises and their spreading are a present phenomenon. However, the world has been affected by financial crises ever since the invention of currency and money market.¹ Of exceptional relevance – not only for economists and politicians - is the question, how financial crises can spread and affect the real economy. Particularly in the wake of the recent US subprime crisis, this subject has become of increasing importance. Various economists developed interesting models to deliver explanations, whereas research gained only little momentum from economic history in the last few years. Financial crises are a regular feature of today's economic life and can be – among others – the source of social and political shocks; therefore, the analysis of past crises has to play a prominent role in modern economic history.

The crisis of 1907 – also known as the "Panic of 1907" – erupted in October 1907 with bank runs in New York's financial district, and the failure of the Knickerbocker investment trust. This panic led to one of the most severe economic crises in the United States prior to the Great Depression, and the experiences from this crisis played a key role in the foundation of the Federal Reserve System – the national bank of the United States.

Before World War I, the developed countries were connected through its exchange rate system, the gold standard. Decreasing transport costs, improved communication systems, trade liberalization and buoyant export growth encouraged foreign lending. Transportation became faster, cheaper and more comfortable and people from Europe could easily immigrate to the new world and were very well received. This apparently perfect world is often referred to as the first age of globalization. Eichengreen/Bordo analyzed 32 crises in the late 19th and early 20th century. They came to the conclusion that these crises where more or less originated in the private sector and the result of a poorly regulated banking system, of a bust-prone real estate market and were generally poorly managed: "Pegged exchange rate system, high capital mobility, asymmetric information, and a weak institution clearly comprised a fertile environment for crises."² The pre-World War I economies had probably substantial similarities to our today's globalized and highly connected world.

¹ The most comprehensive work on financial crises is Reinhart's/Rogoff's "This time is different".

² Eichengreen/Bordo 2001, p15

However, we have only a moderate knowledge about the transmission of these various crises to other business sectors and countries; findings which could also be useful to understand today's economic dependences and complexities.

Some economists have argued that monetary transmission channels might have brought the American crisis of 1907 to Europe. The growing demand for gold of the United States in autumn 1907 led to a liquidity shortage and rising interest rates in Europe, which could have induced economic turbulences in the affected countries.³ However, to my knowledge there exists no empirical study that might confirm this hypothesis.

This work provides an overview of the economic events in the German Empire around the outbreak of the American panic, and is based on available historic data for production, exports and the construction industry. It is shown that the German Empire was heavily affected by the American crisis of 1907, and the German economy suffered a severe setback. However, the trigger which led to the propagation of the crisis was a sudden drop in German exports coupled with the prevailing decrease in domestic demand; monetary transmission channels played only subordinated roles.

This paper is divided into six sections. Chapter two provides the theoretical framework for this work. It defines the term contagion in the context of crises, and gives an overview of the various channels of transmission. Further, it gives a brief outline of research studies and economic models, which explains the outbreak and spreading of panics. Section three summarizes the economic events and cornerstones which finally laid the groundwork for the New York bank runs in October 1907. Furthermore, this section gives an overview of the New York events in October 1907 and its consequences for the American and European economies, and it elaborates the particular German situation in the years before the outbreak of the panic. Section four emphasizes the German economy around the outbreak of the New York panic, with focus on the domestic market - particularly the situation of the construction industry -, and it analyzes the impact and consequences of the American crisis for the German export industry. Chapter five examines the repercussions on the German money

³ Moen/Tallman 2011, p25

market, and on the policy of the German Reichsbank. Finally, the last paragraph summarizes the key points, and highlights the findings of this paper.

2. On the propagation of financial crises

Relating to the transmission of crises, economists define contagion⁴ as the spread of a negative market shock to another part of the economic system, or from the origin country to other countries and – in the worst case – to the rest of the world. Hence, contagion has two characteristics: It can correspondent to regions and to business sectors. But the reaction has to be "fast and furious", which means immediate effects and not a slow adaption or a widely anticipation of economic changes.⁵ In economic literature, the term contagion is commonly used for the transmission of an extreme negative shock in one country to other countries.⁶ Various channels of contagion have been identified and classified into groups.⁷ However, for research on the pre-World War I period it is hardly expedient to go too much into these details, this work therefore focus on financial contagion and the contagion channel trade.

Financial systems consist of various linkages; financial intermediaries – banks, investment trusts, brokerage houses - are linked together through financing and payment systems; they are financing investment projects abroad and have branches or subsidiaries in different regions and countries or partnership structures. Furthermore, reserve requirements force banks to hold deposits with counterparties. By 1900, most finance instruments such as bills of exchange, bonds and equity financing were known and used within the financial network. These interbank claims and payment flows are considered one channel of contagion. In the recent past, there have been published various models and empirical studies concerning domino effects resulting through disturbances in the banking business.⁸

⁴ The use of the term contagion in the context of the propagation of economic crises can be traced back to the Emerging Markets crises in the 90ies. These crises spread to neighboring regions with severe consequences for the affected countries. Forbes 2012, p4

⁵ Kaminsky/Reinhart/Vegh 2003, p4

⁶ Forbes 2012, p6

⁷ Forbes distinguishes between the channels banks, trade, portfolio investors and the reassessment of fundamentals. Forbes 2012, p2

⁸ A good overview gives Allen/Gale 2007

During market turbulences, investors are often forced to sell apparent sound assets to fulfill their bank obligations. These so-called "fire sales" of assets can lead to dramatic chain reactions on the capital markets. In the event of a free fall of all asset prices, even cautious and well diversified investors can be affected and panic sales lead to a further fall of the prices. Diamond/Dybrig explained bank runs as a result of this herd behavior and loss of confidence. Once investors observe risks – an expected bank failure, economic turbulences or market rumors – an increasing risk aversion can lead to an increasing demand for liquidity and therefore to a sudden and heavy withdraw of bank deposits and – in a worst case scenario - to bank runs. The affected banks are forced to liquidate their assets under pressure and with losses.⁹

Further, disruptions of trade relations can have severe impacts on economies. Eichengreen/Rose/Wyplosz analyzed the contagion of financial crises through the channel "trade links" for 20 industrial countries for the period 1959-1993. "The effect of contagion operating through trade is stronger than that of contagion spreading as a result of macroeconomic similarities."¹⁰ An explanation on how a financial crisis can affect consumption, trade and production gives a model, developed by Bacchetta/ Van Wincopp.¹¹ The negative expectations of the market participants can lead to self-fulfilling global panics, as long as there is a minimum level of market integration.

The transmission channels discussed above reflect - more or less - the Keynesian view and the demand side of the economic system. In contrast to these ideas, Friedman/Schwartz emphasized in their "A Monetary History of the United States, 1867-1960" the monetary supply as a cause for the transmission of financial crises.¹²

Before World War I, the available supply of money for a country depended on its stock of gold. Once an economic system suffered from liquidity shortage, there was little scope for the countries as they could not simply start to print paper money. The solutions were to import gold from other gold standard countries or – in a longer perspective - to increase exports and

⁹ Diamond/Dybrig 1983

¹⁰ Eichengreen/Rose/Wyplosz 1996, p37

¹¹ Bacchetta/Van Wincopp 2013

¹² Friedman/Schwartz 1963

reduce imports, which brought liquidity to the country. The national banks were often forced to stop the gold drain in order to protect their own gold reserves. They could made use of technical instruments such as bank holidays, capital transaction controls or simply hamper the handing out of gold coins. The second strategy – often very painful for the domestic market – was to increase the discount rates.¹³

Finally, the spreading of financial shocks can be measured by the co-movements of asset prices, such as stock market prices, spreads of bond prices, commodity prices, and interest rate volatility. However, the evidence of financial contagion effects is weak and has been questioned by various scholars.¹⁴In contrast, according to various empirical studies the contagion channel trade is of great relevance for the transmission of crises.¹⁵

3. The American "Panic of 1907"

3.1 On the eve of the panic

The years before World War I were characterized by steady economic growth rates and a buoyant world trade. Between 1871 and 1913, the average annual growth rates per capita were estimated 1.6% for Germany, 0.8% for Great Britain, and 1.4% for the United States.¹⁶ Furthermore, there was a growing demand for capital, not only for the booming industries but also for infrastructure investments, and the increasing military expenses.¹⁷ Particularly dominated by high capital demands from abroad was the year 1905. These high demands were mainly due to the Russo-Japanese War over territorial claims in Asia. Both countries issued loans to finance this military conflict, which were placed on the markets in Paris, London and Berlin. Compared with the previous years the number of foreign securities issued and sold in Germany increased fivefold. Alone on the Berlin market, the bank Mendelsohn – traditionally closely allied with the Russian empire – and the Disconto-

 ¹³ These conflicts of the pegged exchange rate systems have been modeled by Mundell. Mundell 1963, p475–485
¹⁴ Karolyi/Webb 2004, p10

¹⁵ Forbes 2012, p15

¹⁶ For Germany and Great Britain growth rates are for the Net National Product, and the United States' growth rates are for the Gross National Product.

¹⁷ Burhop 2011, p53-57

Gesellschaft issued Russian bonds valued at roughly 500m Mark.¹⁸ In total, 1218m Mark foreign securities were issued in the German Empire; this high volume could not be achieved again until the outbreak of the World War I.



Foreign securities issued in Germany in million Mark (1901-1913)¹⁹

The warring nations – Russia and Japan - did not draw off their proceeds immediately, but stored them with the western European banks, leading to an enormous cushion of short-term liquidity for the financial market. These capital flows pushed the upward tendency of the German economy and strengthened the liquidity reserves of the German Reichsbank, attaining in February 1905 its highest gold reserves to date.²⁰

But also the Bank of England profited from this situation. Sayers particularly mentioned the good relationship between the Bank of Japan and the Bank of England. "Also the Bank of Japan was borrowing in London for development purposes, on an increasing scale. These circumstances led to the receipt of large sums in London, where they remain under the

Source: Kleiner 1914, p123-124

¹⁸ Disconto-Gesellschaft Geschäftsbericht für das Jahr 1905, p7

¹⁹ These numbers are based on data published by the German Ökonomist, and are the volume of foreign securities placed in Germany, whereas the official statistics of the German Empire published data based on the listed securities; these numbers were much higher and in many cases misleading, as they did not show the actual capital export. Kleiner 1914, p54-56

²⁰ Reichsbank 1925, p13

control of the Bank of Japan, of employment of the market – or to remain in its Other Deposits account at the Bank of England."²¹

The end of the Russo-Japanese War in September 1905 led to a sudden reversal and the glut of money ended. Japan withdrew its reserves from the London market within weeks and this led to an increase of the Bank of England's discount rate within days, from 2.5 % on 7 September to 4% on 28 September. Also the German Reichsbank reported that the German money market was heavily affected by withdrawals from abroad, and the gold and silver reserves of the Reichsbank fell - from its high in early spring 1905 - by nearly 40%.²² As a consequence the Reichsbank was forced to increase the discount rate in steps – from 3% on 10 September to 6% on 11 December. It was not until July 1908 – almost 3 years later – that the low level of 4% was reached again.²³



Monthly average discount rates of the German Reichsbank in % (1904-1908)

Source: Albert 1910, p26-27

This sudden rise was not without consequences for the German Empire. The real estate market and the building industry suffered a severe setback in 1906; until 1908 the residential construction activities dropped by 40%. The 40 German mortgage banks, which lend money upon mortgages and refinanced themselves by selling covered bonds - the Pfandbriefe -,

²¹ Sayers 1976, p40

²² This was the widest spread of reserves' low and high before the outbreak of the war. Reichsbank 1925, p17

²³ Reichsbank 1925, p14

faced a diminishing business; between 1905 and 1907 the mortgage-lending dropped by roughly 30%.²⁴

However, not only the end of the Russo-Japanese War led to a shortage of capital in Europe, also the United States showed an increasing demand for capital from 1906 onwards.

On 18 April 1906, an earthquake in north California– according to estimates measuring 8.3 on the Richter scale – and a subsequent fire due to bust gas pipelines, destroyed the city of San Francisco. The damage was estimated between 350m – 500m USD, which was roughly 1.3% – 1.8 % of the American Gross National Product in 1906. European insurance companies - half of them were British - underwrote the majority of the city's fire insurance policies.²⁵ In addition to the usual liquidity demand, these insurance payments led to an increase of gold exports from London to the United States. During the first 6 months of 1906, gold to the value of £6m was shipped from London to New York and in total, £10m or 50m USD were sent from Europe to the United States.²⁶

In the British press, this huge liquidity demand of the United States was an ongoing topic and it was attributed not only to the earthquake but also to the United States' growing industry and its capital requirements. "But we cannot help thinking, despite the losses of the earthquake; the catastrophe may in some respect prove to be a blessing in disguise."²⁷ However, it was not only America that was drawing gold from England. In 1906, the British gold exports to Egypt reached almost £6m, compared with £1.5m in 1905; this was an increase of almost 250%.²⁸ Therefore, the Bank of England was forced to raise its discount rate again to 6% in October 1906 - from 3.5% in September - and the Bank of France, in order to keep pressure off the own gold reserves and to avoid an increase of the French interest rates, started in November 1906 to discount British financial bills and in this way provided liquidity for the Bank of England.²⁹ Furthermore, the Bank of England placed some

²⁴ Die Bank 1908, p343

²⁵ Odell/Weidenmier 2002, p2-7

²⁶ Odell/Weidenmier 2002, p8-10

²⁷ The Economist, May 5, 1906, p758

²⁸ These high gold flows were mainly due to the growing cotton exports of Egypt, but also speculation and rising real estate prices in the booming centers led to an increasing demand for liquidity.

²⁹ Sayers 1936, p107-108

pressure on the London banking houses to stop the discounting of American short-term bills, and the subsequent gold export to the United States. This free discounting of American finance bills was highly discussed in the British press and the London banks were accused of making high profits at the expense of the Bank of England and the British economy.³⁰

The following year was now dominated by the market player on the other side of the Atlantic, by the increasing demand for liquidity of the United States.

The question of whether the preconditions for the German recession in 1907 were already laid in 1905 - with outflow of capital and the sudden rise of the interest rates – will be discussed in the following chapter. A few years later, before the outbreak of the war, a heated debate sparked off – launched by conservative politicians - whether investments in foreign securities would weaken Germany's readiness for war.³¹ However, the implications of the 1905 capital outflow – the highest capital export in the pre-war period - for the domestic economy found only little attention.

3.2 The panic

Autumn 1907 brought the United States a banking panic, a stock market crash and finally a severe recession with painful implications for the labor market. The unemployment rate doubled within months,³² and thousands of immigrants had to leave the country again, due to the lack of employment.³³ The panic may have been induced by the credit tightening of the Bank of England and other European central banks, but the trigger was finally the failed attempt of two copper oligarchs to corner the stocks of a Montana copper mining company. This hefty take-over battle - in combination with market rumors and interdependencies between the vanquished copper baron and New York's banking houses - led in October 1907 to the New York bank runs and the failure of a well-known investment company - the Knickerbocker Trust.³⁴ Since the turn of the century, these investment trusts became

³⁰ The Economist, March 11, 1906, p1780

³¹ Helfferich 1911, p207-217

³² According to recent estimates from approx. 3% in 1907 up to 8% in 1908.

³³ Wicker 2000, p108

³⁴ Lingenfelter 2012, p90

increasingly popular and had - more or less - the role of a shadow banking system. They were not members of the New York clearing house, and they were not obliged to fulfill minimum reserve requirements. The growing turbulences in New York's financial district amplified the shortage of liquidity and led - in connection with market rumors and an overall poor communication – to an outbreak of a general banking panic. Without a central bank as a lender of last resort – the central bank of the United States, the Federal Reserve System, was founded 6 years later – the situation escalated and only due to the initiative and actions of a group of New York financiers led by the banker John P. Morgan, and with the help of the US Treasury and the New York Clearing houses, the pressure on New York's banks and the stock market could be mitigated.

The New York panic led nationwide to more than hundred banking failures, and the money supply was heavily constrained for industry and trade. Interest rates for daily money spiked up to 100% during these panic days, which led to a fire sale of assets on the New York stock exchange, as stock brokers usually depended highly on short term liquidity.³⁵

To attract gold from abroad – main counterpart were the British banks - the American banks offered gold premiums up to 4%. It is estimated that in November and December 1907 roughly 100m USD found its way to New York.

However, it has to be questioned, whether the gold premium payments as such attracted the gold inflow. In November and December 1907 the United States gained an enormous trade surplus. In December 1907 imports were the lowest within the previous 5 years and exports almost doubled.³⁶

³⁵ Tallman 2013, p16-17

³⁶ Wicker 2000, p100



Merchandise trade balance of the United States in 1906-1908 in million USD

Source: www.nber.org/databases/macrohistory/rectdata/07/m07047.dat

The Americans solved their liquidity problem with extensive exports and an abstention from imported products. The European merchant houses, which were the recipients of this affluence of American goods – mainly agricultural products - had to pay for their imports with gold transfers to New York.

The European central banks of the big gold standard countries felt the pressure and started to increase their discount rates. Particularly affected was the German Reichsbank, which raised the discount rate in November 1907 to 7.5%, a level which had not been attained before, but also the discount rate of the Bank of England reached the 7% in late autumn 1907.



European monthly average discount rates in % in 1907

Source: Schär 1908, p147

In line with the monetarist approach, some scholars stated that these liquidity drain and gold exports to the United States were causal for the transmission of the crisis to Europe.³⁷ The liquidity outflows and the high discount rates, as a result of the drainage of the gold reserves from the European central banks, must have led to financial stress for the European industries. In other words, a monetary shock from the supply side must have been the transmission channel. "In addition, we suggest that the large-scale imports of gold from abroad effectively spread the financial crisis in New York worldwide, by draining liquidity away from other financial markets."³⁸ However, the assumption that monetary distress brought the crisis of 1907 to Europe has to be questioned.

There was a recession in the German Empire around 1907; this has been confirmed by various empirical studies on business cycles. However, the recession had its origins not in autumn 1907; the slowdown of the economy started already 12-18 months earlier.

³⁷ For example Kindelberger 1996, p175-176

³⁸ Moen/Tallman 2011, p27

3.3 The German economic downturn

The main barrier to research on business cycles before World War I is the poor data quality. The German Statistische Reichsamt published a rough National Income statistic for the whole empire, based on the statistics of the taxable income of the Prussian state. In the 1960s, Hoffman and his colleagues³⁹ attempted to revise, correct and extend these statistics, but the quality and reliability of this data has often been questioned and debated by various scholars. Nevertheless, despite all the weaknesses of Hoffman's corrected data, they found their way into many international standard publications. All today's available series of estimates on National Income in the period before World War I, are more or less based on Hoffmann's work.⁴⁰ However, all these data – regardless their quality – are too vague and contribute only little concerning the research on specific economic cycles.

Burhop/Wolff developed a compromise estimate of the German Net National Product - based on all these estimated series - and with some statements on growth and business cycles for this period. Between 1851 and 1913, 11 booms and 12 recessions were identified, with an average cycle length of around 5 years. After strong fluctuations in the 19th century, the amplitudes decreased in the first decade in the 20th century. The new century started with a recession in 1900-1902 - the crisis of the electricity industry – and after a phase of prosperity and growth in 1904-1905, a recession followed, with the deepest decline in growth in 1906.⁴¹

The most detailed study on business cycles before World War I, based on historical time series, is from Grabas. On the basis of monthly data, Grabas identified two phases of a German recession around 1907. The first downward push was observed at the beginning of 1906, and a second – slightly weaker – push set in between the end of 1907 and the first months of 1908.⁴² These results differs slightly from the older business cycles studies by Spree or Spiethoff who identified the year 1907 as the reversal point with a recession in the following year.⁴³

³⁹ Hoffmann 1965

⁴⁰ Ritschl/Spoerer 1997, p29-38

⁴¹ Burhop/Wolff 2005, p645-645

⁴² Grabas 1992, p122-123

⁴³ Spiethoff 1955, p147 and Spree 1978, p103.

According to current economic research on asset pricing models, business cycles are reliable mirrored by the developments on the stock exchange.⁴⁴ In the period from 1904 to 1908, the prices on the Berlin stock exchange showed the following developments:

Monthly and annual average prices for fixed income securities on the Berlin stock exchange for securities

Year	Month	Low	Month	High	Average p.a.
1904	Feb	95.49	Jan	97.89	96.48
1905	Dec	95.44	Aug	97.73	96.72
1906	Sep	92.19	Jan	95.53	93.85
1907	Aug	89.27	Jan	93.22	90.79
1908	Apr	90.22	Dec	91.70	90.96

Source: Esslen 1909, p101

Monthly and annual average prices for dividend paying securities (stocks) on the Berlin Stock exchange

Year	Months	Low	Months	High	Average p.a.
1904	Feb	143.11	Dec	159.94	153.91
1905	Jan	162.06	Sep	175.60	168.82
1906	July	160.30	Jan	165.43	163.25
1907	Dec	142.65	Jan	160.59	149.29
1908	Feb	142.41	Dec	148.09	145.34

Source: Esslen 1909, p102

The fixed income securities reached their peak in August 1905, and then began to drop steadily by around 8% until August 1907. The stock market peaked in September 1905, and subsequently declined by 18% until February 1908. The turnover on the German stock exchange – measured by the stock exchange stamp duty – reached its peak in September 1905, and had its lowest point in December 1907.

In line with the findings of the individual studies on business cycles the stock exchange reached its low in 1907 - the recession year. However, the financial markets had already

⁴⁴ Ritschl/Uebele compared stock market data with the Hoffmann National Income series. Ritschl/Uebele 2005

turned in summer 1905, exactly when the discount rates of the German Reichsbank started to rise.

The various studies on business cycles in the German Empire showed - more or less – similar results; a reduction in growth and/or a turning point for the year 1907. However, some findings indicated an earlier downturn in 1906; a result which was also reflected by the Berlin stock and bond market developments and the problems of the German building industry as of 1906.

4 Domestic and foreign demand

4.1 The building industry

This paragraph examines the effects of the interest rate spike in autumn 1905 for the German economy. The basis for this assessment are studies on the German building industry by Hunscha, Wellenreuther and Grabas, and own elaborations based on data from the statistical yearbooks of the German cities.

The years 1906-1908 were periods of crises for the German building industry; the residential construction in the cities declined by more than 40%.⁴⁵

The long-term growth factors for this sector of industry were mainly demographical developments, such as immigration - from the rural areas in the east to the big cities in the west - and marriages with the establishment of new households.⁴⁶ The real estate market was an important economic sector for the German Empire and - according to Hunscha - a pacemaker of the whole economy. It was the leading indicator of the general economic development, and this sector recovered faster from periods of depression, but reached its peak early than other sectors - already during an overall economic upturn.⁴⁷

⁴⁵ Own calculations based on the statistical yearbooks of the German cities. Statistische Jahrbücher Deutscher Städte 1906-1912

⁴⁶ Wellenreuther 1989, p162-165

⁴⁷ Hunscha 1930, p44-46

Between 1850 -1913, an average 30% of all invested funds went into this branch of the economy.⁴⁸ In 1907, more than 2 million people worked in the building industry and it was the most important domestic consumer of the iron and steel industry.

According to Wellenreuther's research on the residential property market in the 5 German cities of Munich, Frankfurt, Dortmund, Hamburg and Berlin, in 1907 the building industry was in a severe recession, but the course of the crisis differed significantly in these 5 regions. In Munich, the real estate market peaked in 1900 and dropped until 1907, when there was a complete standstill in building activity. The level of newly built houses in 1900 was only reached again more than 10 years later in 1911. In Dortmund and Hamburg, 1905 was a peak year, and thereafter a sharp downturn followed, reaching its nadir in 1908. In Berlin, the peak was reached in 1906 and the market subsequently dropped; only Frankfurt experienced buoyant building activity until 1907.⁴⁹

Hunscha calculated the average new supply and demand for housing for 5 German cities -Hamburg, Leipzig, Lübeck, Magdeburg and Dresden. Until 1905, the demand was significantly lower – up to 30% - than the supply of new housing. An oversupply of residential property had arisen in the German cities, which had its origins around the turn of the century. The year 1905 showed a distinct trend reversal, and in 1907 the demand for housing in the German cities exceeded the supply by far.⁵⁰

Grabas developed a wider commingled construction growth index, which includes not only the residential building activities, but also the public sector and the public spending's for real estate and infrastructure projects. According to these findings, the growth rate peaked around 1903-1904 and reached a nadir in 1907-1908. The town construction activities declined approximately 25% within 5 years. And it was the residential real estate sector which led to the sharp decline, not the public infrastructure building activities. In the period from 1904 -1908, the residential building activities decreased by more than 40%⁵¹

⁴⁸ Wellenreuther 1989, p157-158

⁴⁹ Wellenreuther 1989, p294

⁵⁰ Hunscha 1930, p60-61

⁵¹ Grabas 1992, p198-204

The cause of this sudden stop might have been demographical shifts. Between the turn of the century and 1913, the number of marriages dropped in the German urban areas by roughly 12% and in rural areas by 10%.⁵² This decreasing rate of marriages was probably an important indicator for long term developments, but precisely in the years 1903-1906, the number of marriages increased slightly; presumably due to the prospering economy.

Average number of marriages per 1000 inhabitants in 12 German cities.

Year	1901	1902	1903	1904	1905	1906	1907	1908
Marriages	9.44	8.84	8.92	9.05	9.22	9.27	9.27	8.81

Source: Hunscha 1930, p59

The high building activities around 1900 were the result of an overestimation of the future demand for housing in the German urban areas, bolstered by cheap money from the capital market. Not surprisingly, the sharp reversal coincided with the rising interest rates in autumn 1905. Research on long-term developments showed only weak negative correlations between rising interest rates and a decrease in building activity.⁵³ However, the spiking interest rates in 1905 – a rise of almost 100% within weeks – were a severe shock and provoked this strong reaction.

The financing of the typical tenement in the German cities – the so called "Mietskasernen" - was mainly provided by the 40 German mortgage banks, followed by the Sparkassen and the insurance companies.⁵⁴ The mortgage banks refinanced themselves by the issuance of long-term securities – the Pfandbriefe. Until 1905, the average interest for the issued Pfandbriefe was approximately 1% higher, than the market interest rates. Therefore, an investment in these securities was highly attractive for domestic and foreign investors. In 1902, the spread between the interest of the Pfandbriefe and the market interest rate widened to almost 2%, and the building industry boomed. Between 1902 and 1903, the number of covered bonds in circulation increased by 50%. The low market interest rates and attractive returns from investments in covered bonds led to a considerable capital inflow, which stimulated the construction activities in the cities, and resulted in an oversupply of housing units.

⁵² Grabas 1992, p208

⁵³ Wellenreuther 1989, p154-156

⁵⁴ Hunscha 1930, p24-27

Pfandbriefe interest vs. private discount rate in %, circulation of covered bonds in million Mark, and average new supply and demand for housing units in Hamburg, Lübeck, Magdeburg, Dresden and Leipzig

Year	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908
Interest	3.94	4.00	4.00	3.98	3.78	3.87	3.84	3.94	4.02	4.02
Pfandbriefe										
Market rate	4.45	4.41	3.06	2.19	3.01	3.14	2.85	4.04	5.12	3.52
Pfandbriefe in	376m	120m	169m	305m	451m	435m	504m	341m	262m	481m
circulation										
New supply	1543	1615	1567	1933	2656	2731	2209	1978	1653	1295
housing units										
New demand	1572	1339	1275	1427	1957	2332	2250	2560	2203	1724
housing units										

Source: Hunscha 1930, p60-61

However, the situation changed from 1905 onwards, and for the following two years an investment in Pfandbriefe became less and less attractive. Between 1905 -1907, the volume of these papers in circulation halved. The rising interest rates in 1905 were the trigger for a sharp market reversal; building activities declined and from 1906 onwards the demand for housing succeeded now the supply. The German real estate market suffered from 1905 onwards, and reached its low somewhere between 1906 -1907.

Flexible rents would have been useful to help to overcome the situation and clear the market. However, in the whole period, the rents remained stable or even increased slightly.⁵⁵

The factor of the demographical changes – the decreasing number of marriages – could have reinforced the oversupply in the years 1901-1904, but from 1905 onwards the rising capital costs dominated the market, and a hefty correction followed.

Unfortunately, this German real estate crisis reached its peak in 1907 and coincided with the massive correction in the United States, which led in the following year to severe problems for foreign trade and export-oriented economic sectors.

⁵⁵ Wellenreuther 1989, p313

4.2 Production and trade

Grabas calculated an aggregated production curve for the German Empire based on the production data for pig iron, coal, building material, imports and shipping data - according to the statistics of the Prussian railroad company. The results show that the downturn in production occurred in two phases; a first impulse became visible in 1906, and a second negative stimulus appearing at the end of 1907 and beginning of 1908.⁵⁶ The production reached its peak at the beginning of 1906, and from there it remained – slightly regressive - at a high level until summer 1907. The curve started to drop rapidly in the last months of 1907, and reached its trough at the beginning of 1909.⁵⁷ These results are very much in line with the findings for the building industry and the decline of housing construction in urban areas. At the beginning of 1906, construction activities already started to stumble, and led to the end of a 5-year growth period.

The building industry was an important customer of the German iron and steel manufacturers, and therefore the sales figures for semi-finished products, such as steel girders and grids already fell in 1906. The sales peak was reached - at 527,857 tons - in March 1906, whereas in June 1908 only 378,361 tons were sold; a massive decline of almost 30%.⁵⁸

However, the overall production of iron, steel and coal remained more or less stable for the next 17 months - until winter 1907 - and reached its low around 12 months later. Still in November 1907, the industry reported record high production volumes of 1.1m tons of pig iron; these figures could not be reached again until October 1909.

The German economy compensated the weak domestic demand by pushing its exports, and the flourishing economies in Europe and the United States led volumes of trade increase. The year 1906 and also the first months of 1907 showed record-breaking high export figures. Therefore, the overall production – apart from building industry related sectors – remained more or less intact until the beginning of 1908.

⁵⁶ Grabas 1992, p122

⁵⁷ Grabas 1992, p126

⁵⁸ Schipel 1908, p49

In the years before World War I, the German trade balance was constantly negative, which implied that the German imports exceeded the exports. The trade deficit was successfully covered by capital gains from foreign investments. However, the export sector was a growing sector and became more and more important for the German Empire. Its share in world trade increased steadily to roughly 12% until the outbreak of World War I, and Germany became – after Great Britain and the United States – the third largest export nation. Trade and tariff policy was an import part of the German economic system; custom duties went mostly to the imperial government and were regarded as an important source of income.⁵⁹

The German trust organizations – mainly the steel and coal trusts - tried constantly to compensate fluctuations in domestic demand with foreign trade; and contemporary observers reported in 1908 that the markets had been overrun with cheap German steel and iron products at dumping prices.⁶⁰

The major receivers of the German exports were Great Britain, Austria-Hungary, the United States, France and Russia.⁶¹ The most important German export branches were the steel and iron industries - followed by the chemical and pharmaceutical industries. Between 1906 and 1907, German exports increased in total by 9%, however the setback came in the last 3 months of 1907, and export figures dropped by 8% compared with the exports of the last three months of the previous year. In the following year 1908 - in line with other exporting nations - German exports dropped by almost 7%, from 6,840m Mark in 1907, to 6,400m Mark in 1908.

⁵⁹ Burhop 2011, p104

 $^{^{60}}$ Schippel 1908, p47 and Esslen 1909, p290

⁶¹ Calwer 1912, p283



Quarterly German exports year-on-year change 1906 - 1908

Source: Data from Grabas 1992, p372

Even worse affected were Great Britain, Japan and Switzerland, with setbacks of more than 10%; in contrast, the exports of the United States remained more or less stable in 1908.⁶² Germany's exports to the European countries - Great Britain, Switzerland, Belgium, and France – fell only slightly by 2.5% or 108m Mark; however the decline in exports to America - United States, Argentina and Brazil – reached more than 20%, almost 290m Mark, and the exports to the United States decreased by almost 25%, more than 160m Mark. But not all exports suffered in 1908; the German Empire could increase its exports to Austria-Hungary, Italy, Russia, and Norway.⁶³

Particularly affected were the German exports of consumer goods, which fell by more than 12%, while the export of production goods decreased by only 5%.

⁶² Calwer 1912, p278

⁶³ Statistisches Jahrbuch für das Deutsche Reich 1909, p221-222





Source: Wagenführ 2008

The November 1907 export figures of the United States showed - compared with the German Empire - a different picture; exports rose considerably and imports dropped. The rush to market their export goods - agricultural products such as cotton and wheat - to provide the country with liquidity had been started. Moreover, imports of what was generally classed as luxuries – jewelries, watches, porcelain, textiles - had been reduced.⁶⁴ Alone in November 1907, the United States' exports – compared with November 1906 - increased by 12%, whereas imports fell by 8%. The massive rise of exports and the drop in imports had been the perfect measure to fill the vaults at the New York banks, with the - so desperately needed - gold reserves.

In 1908, the imports of the United States decreased by roughly 20%, from 1,434m USD in 1907, to 1,194m USD in 1908. Whereas the exports of the United States decreased only slightly from 1,880m USD in 1907 to 1,860m USD in 1908. The trade balance of the United States improved between 1906 and 1908 by roughly 30% - at the expense of the European economies.⁶⁵

⁶⁴ The Economist, December 28, 1907, p2302

⁶⁵ Esslen 1909, p291



Total Imports and Exports of the United States in million USD

Source: www.nber.org/databases/macrohistory/rectdata/07/m07023.dat and m07028.dat

The German export of porcelain to the United States declined by more than 60%, the export of toys and Christmas ornaments dropped by almost 40% and the exports of textiles of more than 30%.



German consumer goods export to the United States in million Mark (1907-1909)

Source: Statistisches Jahrbuch für das Deutsche Reich 1909, p229

The United States – by then a loyal customer of European products – tumbled and refrained from imported products from November 1907 onwards. Due to the financial crises, the number of business failures increased massively in the United States, and the unemployment rate doubled. Adequate reasons enough for American consumers to forego imported luxury goods, and a consumer-friendly nation turned into a nation of savers.

In 1907, the German economy suffered twice – from a declining domestic demand, which can be traced back to the year 1906, and from an export crisis one and a half year later. The German industry tried constantly to overcome a weak domestic demand with increased exports. But from November 1907 onwards, this compensating measure failed, and the weak demand from abroad exacerbated the German domestic crisis.⁶⁶

5. The German Reichsbank and the money market

The money market – the market for short-term liquidity – was the most important liquidity provider for the German industry and trade, and the dominant players in this market were the German commercial banks. Any effects on this market – whether positive or negative - had consequences for the German economy. In contrast, the German Reichsbank was mainly the lender for the commercial banks, and their demand for liquidity increased significantly during the regularly periods of cash-flow bottlenecks in autumn. In the following, the conditions and developments of the German money market and the Reichsbank's policy in the years around 1907 are examined.

The German Reichsbank - as successor to the Prussian State Bank - started operating in January 1876. According to the German banking law - its main tasks were to manage and regulate the monetary circulation in the German Empire, to facilitate the inter-bank clearing and settlement of payments, and to guarantee the supply of the available capital. Furthermore, the Reichsbank was the fiscal agent for the German imperial government and other state-owned bodies. The Reichsbank was under formal control of the government, as the German Chancellor was the official head of the Reichsbank. The executive organs – the President and the board members – were nominated by the Bundesrat, and had the status of

⁶⁶ Grabas 1992, p130 and Henschel 1978, p115

civil servants. In practice however, the Reichsbank was mostly free from government influences and enjoyed – more or less – autonomy.⁶⁷

The Reichsbank was required to maintain full cover in bullion, coins and eligible bills against the outstanding banknotes, and was obliged - at any time - to exchange banknotes in gold and silver coins. Furthermore, one third of the issued notes were required to be backed to gold (coins or bars),⁶⁸ and until 1910 only gold coins were the official currency.⁶⁹ Eligible bills were – according to the prevailing real bills doctrine – high quality bills with three signatures and a three-month duration at most. The money creation was mainly due to the discounting of bills and its regulation through the setting of the discount rate; a rate which reflects the drawing in the credit facilities of the Reichsbank. For the German commercial banks, the Reichsbank had the function of a lender of last resort and was – more or less - a guarantor for safety, stability and a liquidity provider.⁷⁰

Before World War I, the most import financial instruments for industry and trade were commercial bills, which were usually discounted by the commercial banks. On the average only 10-15% of the German circulating bills were held by the Reichsbank, but at the usual terms of payments – end of the quarter and particularly in September and December – this amount could increase enormously. At these peak periods, the German commercial banks showed a massive demand for short-term liquidity, which could only be covered with the help of the Reichsbank's reserves. The Reichsbank justified this phenomenon in its reports with the increasing number of credit transactions, more and more commonly accepted by industry and trade, which led to a growing demand on liquidity at payment terms.⁷¹

⁶⁷ In 1880 and 1887 Bismark interfered twice; he ordered to raise the discount rates and stopped the discounting of Russian bonds. Holtfrerich 1988, p111-113

⁶⁸ In the case, the issuance of banknotes exceeded the coverage requirements over a certain limit, the Reichsbank faced a tax penalty of 5%.

⁶⁹ The silver Taler remained legal tender until 1907, and only in 1909 banknotes became legal tender.

⁷⁰ Bopp 1953, p41

⁷¹ Reichsbank 1925, p23

	Average amount discounted bills p.a.	Peak amount discounted bills	Average coverage ratio p.a. (gold)	Lowest coverage ratio (gold)
1904	801m	1.074m - on 31 March	52.9%	35.5% - on 30 Sep
1905	875m	1.305m – on 30 Sep	55.8%	31.4% - on 30 Sep
1906	946m	1.349m – on 30 Sep	48.6%	27.1% - on 31 Dec
1907	1.060m	1.470m – on 31 Dec	42.9%	26.4% - on 31 Dec
1908	897m	1.277m – on 07 Jan	51.5%	32% - on 07 Jan

Discounted bills by the German Reichsbank in million Mark, and cover ratios of banknotes

Source: Reichsbank 1925, Anhang p34-35 and p68-69

From 1905 onwards, the German banks – faced with the high capital drain - intensified their discounting at the Reichsbank; between 1904 and 1907 the volume of the average discounted bills increased by 30%. Particularly affected were the months September 1905, September 1906 and December 1907; and roughly 50% of the discounted bills had a duration less than two weeks.⁷² As a result, the average gold coverage of the banknotes fell from 72% to 57%, and the ratio reached a remarkable low of 37% in the months December 1906 and 1907. This rising demand for short-term money affected the Reichsbank's policy, and regularly led to rising discount rates in autumn and at year end.⁷³

However, the majority of commercial bills were discounted by the German banks, which had historically strong linkages with the industry, and the discounting of bills was the main source of credit for German companies. Therefore – apart from the official discount rate of the Reichsbank – a second market interest rate, the "Privatsatz" had been established and were much more important for industry and trade than the discount rate of the Reichsbank. The "Privatsatz" was created by the Berlin stock exchange as a result of supply and demand, or offered directly by the banks as a preferred rate to their major customers.⁷⁴ In the first decade of the new century, the "Privatsatz" was on average 1% below the official discount rate of the German Reichsbank.

⁷² Reichsbank 1925, Anhang p69-71

⁷³ Reichsbank 1925, Anhang p33

⁷⁴ Prion 1907, p26-27

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
1905	1.74	1.69	0.78	1.09	0.70	0.66	0.88	0.77	0.68	0.93	0.83	0.84
1906	1.76	1.65	0.98	1.56	1.48	0.82	1.01	1.07	0.49	0.87	0.73	0.85
1907	1.78	1.34	0.60	1.18	1.06	0.83	1.05	0.89	0.43	0.67	0.66	0.47
1908	1.76	1.52	1.11	1.31	1.09	1.02	1.24	1.18	0.86	1.21	1.46	1.08

Monthly spreads between market rate (Privatsatz) and discount rate in %.

Source: Albert 1910, p30-31

But the spread decreased regularly – between 20-50 basis points - at the end of quarters and in autumn, and increased again in January. Particularly affected was December 1907, with a spread 40 basis points lower than in the corresponding months of the previous years; the monetary effect of the declining American imports and the sudden rise in exports was clearly noticeable.

The increasing shortage of liquidity - which had started in 1905 - culminated in autumn 1907, and the German commercial banks bridged their liquidity gaps with the help of the Reichsbank. In August 1907, the bill portfolio of the Reichsbank reached 1094m Mark, one month later 1445m Mark, and at end of December it stand at 1470m Mark. Accordingly, the discount rate was steadily increased until it reached its peak on 8 November at 7.5%.

At the end of 1907, the discounted bills of the German Reichsbank reached almost the same volume as the bill accounts of the 6 big German banks - Deutsche Bank, Disconto-Gesellschaft, Dresdner Bank, Darmstädter Bank, Schaaffhausen'sche Bankverein, Berliner Handelsgesellschaft.⁷⁵ However, the situation quickly returned to normal in the following months.

The Reichsbank had the function of a lender of last resort for the commercial banks, which worked perfectly well in the years from 1905 onwards. The increasing discount rates and the – higher than usual - decreasing spreads of the market rates in autumn 1907 coincided with the changed trade conditions; however, the periodic outbreaks of liquidity shortages had already started in 1905, with its implications for the interest rate sensitive industries.

⁷⁵ Helander 1912, p194

The high discount rates in autumn 1907 led to intense discussions – particularly among representatives of the conservative parties and the agrarian-right – on how to protect the Reichsbank in the future from international turbulences. The high interest rates were not seen as a result of the trade balance but as a result of international capital movements – regardless of their causes. Finally, this criticism led to the resignation – officially due to the reasons of age - of the Reichsbank President Richard Koch in December 1907. His successor Rudolf von Havenstein – the former president of the Prussian State Bank – set out an Enquete-Commission in summer 1908. The outcome was a more stringent route⁷⁶ concerning the growing business and liquidity demand of the commercial banks.⁷⁷ However, already among contemporary observers these measure were regarded as useless, and a few years later – in 1911, with the outbreak of the Morocco-crisis and a renewed outflow of capital – the Reichsbank policy was again subject of severe criticism.⁷⁸

6. Conclusions

Research on economic episodes of historical interest before World War I is based mainly on estimated and retrospectively reconstructed aggregated data. However, this poor quality of data is a major obstacle for research on economic cycles in this period of time. To ascertain economic coherences and transmission mechanisms, detailed studies on individual business sectors on the basis of accurate historic data – where available – are essential.

As shown in this paper, the German recession of the years 1906-1908 had its roots in a residential real estate crisis, which led subsequently to a weaker demand in other related industries. In autumn 1905, the interest rates almost doubled - due to political turbulences -, and the German economy had been caught more or less unprepared by this monetary shock. For the following years, it was faced with rising interest rates and an increasing money market volatility.

⁷⁶ From 1912 onwards commercial banks were forced to report on a two-monthly basis and Havenstein demanded more voluntary self-regulations and higher liquidity reserves for the banks.

⁷⁷ James 2001, pp99-103

⁷⁸ Lansburgh 1914, p38-40

The contagion channel which led to a spread of the American crisis - with severe consequences for the European economies - was the downturn in exports. In the wake of the New York panic, the United States pursued a strategy of growing trade surplus. They had been reluctant regarding imports but had forced their exports massively, which led to serious economic problems in the European export oriented countries. Therefore, the German Empire was caught up in the aftermath of the "Panic of 1907" at a highly inconvenient moment; that of a shrinking domestic demand which could no longer be compensated – as in previous periods of crises - by higher export shares.

The economic downturn in the German Empire was a result of a diminishing demand, first on the domestic side – and later in the course of the crisis – on the international side.

The German politician and economist Max Schippel wrote in 1908 about the sources of the recession in Germany: "Die entscheidende Störung liegt also nicht oder längst nicht mehr in dem Missverhältniss zwischen Produktion und Umlaufs- und Zahlungsmittel, oder zwischen Produktion und Leihkapital, sondern in dem Missverhältnis zwischen Produktion und nachgefragten Verbrauch, zwischen Warenangebot und kaufkräftiger, kauffähiger Warennachfrage."⁷⁹

The sudden drop in the American demand in 1907- 1908 affected other export oriented countries as well. But countries with a strong and stable domestic demand, could overcome these effects much easier than the German Empire.

Overall, this research shows that the economic demand side – consumer behavior and trade relations – should find more attention in economic history. Furthermore, economists could also gain valuable insights from these findings for current research on economic cycles.

⁷⁹ Schippel 1908, p68

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