Hyperinflation and Stabilisation in Poland, 1919 - 1927: 'War of Attrition' or Politics by Other Means?

1. Introduction

Hyperinflations are events of perennial interest to economic historians, and the early 1920s are almost unique in the extent of the monetary instability that followed the destruction of the classical gold standard in the fires of the First World War. When it had become clear that the troops would not be 'home by Christmas' and that the ongoing war effort would need to be sustained by an unprecedented re-orientation of the entire resources of the economy, the free convertibility of national currencies into gold went by the board in virtually all of the countries taking a share in the fighting, along with many of the neutrals. The end of the fighting in 1918 failed to bring a swift restoration of the pre-war monetary system. While most national governments agreed in principle that the return to a gold-based currency was a prerequisite for the re-establishment of normal economic relations and signed joint statements and resolutions affirming their commitment to return to gold at the economic conferences of Brussels (1920) and Genoa (1922),[1] their ability to do so was constrained by the degree to which they had been forced to resort to seignorage as a means of financing the war effort.

Essentially, three sets of outcomes then prevailed. On the one hand, for countries that had managed to cope with the exigencies of wartime without dramatic increases in the monetary base— the United Kingdom is a prime example— it was possible to return to the gold standard at the pre-war parity, albeit at the cost of several years of tight monetary policy and deep recession in order to bring about the necessary decrease in prices. On the other, those countries that had been forced into large increases of the monetary base during wartime— for instance France, where prices had approximately doubled between 1914 and 1918[2]— found a return to gold at the pre-war parity infeasible, and there ensued a more or less protracted struggle against ongoing inflationary pressures to return to gold at a reduced parity.

For four countries, Germany, Austria, Hungary, and Poland, the challenges of returning to the gold standard at any parity proved insuperable. These countries continued to rely heavily on seignorage to meet expenses even after 1918, and the result was an uncontrolled expansion of the money supply and an ever-escalating spiral of price and wage increases. By the time the hyperinflation was finally reined in, the nominal value of money in circulation stood in Austria at

[1] Barry Eichengreen. *Golden Fetters: The Gold Standard and the Great Depression, 1919-1939* (1995), pp. 153-162

[2] Pierre-Cyrille Hautcoeur. "Was the Great War a Watershed? The Economics of World War I in France," in *The Economics of World War I,* eds. Stephen Broadberry and Mark Harrison (2005), p. 187.

14,400 times, in Hungary at 14,800 times, in Poland at 1.8 million times, and in Germany at over one trillion times the level of 1914.[3]

For the countries that experienced them, the hyperinflations of 1918-1924 were traumatic events, whose consequences cast a pall over the troubled remainder of the interwar period. It is widely appreciated that the German hyperinflation "caused profound, and ultimately fatal, damage to the Weimar system," not only economically, but also by adding a potent source of disaffection to an already volatile political culture.[4] In her recent work on Austria and Hungary, Macher has made a powerful case for the central role of the hyperinflations in those countries in creating the incentives that led to the financial crises of 1931, which not only had a profound influence on the Austrian and Hungarian economies' trajectory through the Great Depression, but also likely played a role in precipitating the great wave of departures from the reconstructed gold-exchange standard, including the United Kingdom's suspension of gold convertibility, by the end of that year.[5]

In contrast to these well-studied cases, comparatively little has been published about the hyperinflation in Poland, either in English or in Polish[6]. The works in this literature have tended to be either descriptive in nature, providing a narrative of events but providing little by way of analysis of the factors causing the rate of inflation to speed up or decelerate; or conversely, as with Thomas Sargent's well-known comparative study of the four major European inflations[7]—have given a plausible economic explanation of the dynamics of the hyperinflation (in Sargent's case, the rational expectations hypothesis), but have fallen short of putting that explanation to a formal empirical test.

There are several reasons why this deficiency is particularly glaring in the Polish case. The first is the close link, discussed above, between a country's experience with hyperinflation in the 1920s and its subsequent fortunes during the Depression. There is good reason to believe that such a connection exists in the Polish case as well, not least because the failure of the parliamentary governments of 1920-26 to bring about price stability has often been cited as a catalyst for Marshal Piłsudski's military coup of May 1926[8], and the post-coup governments relied heavily on their 'sound money' credentials as a source of legitimacy and a counterpoint to the 'Sejmocracy' ('Sejm' being the Polish term for the lower house of Parliament) that had preceded

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[3] Sargent (1982), p. 44

[4] Niall Ferguson and Brigitte Granville. "'Weimar on the Volga': Causes and Consequences of Inflation in 1990s Russia Compared with 1920s Germany", *Journal of Economic History* 60, No. 4 (Dec. 2000), p. 1062.

[5] Macher (2018, 2019).

[6] An extensive discussion of the relevant historiography is left to Section 3.

[7] Sargent (1982).

[8] See, for instance, Garlicki (2017).

them.[9] Understanding the (hyper)inflation of 1919-1927 therefore stands to shed much light on the puzzle of why the Piłsudski government remained committed to the gold standard until the bitter end in 1936, despite the profound economic sacrifices that this policy entailed.

No less important, there exist differences between the Polish experience of runaway inflation on the one hand, and that of the defeated Central Powers on the other. In contrast to Germany, Austria, and Hungary, Poland was not a sovereign state during the First World War (having been partitioned between the Hohenzollern, Habsburg and Romanov empires in 1795), but gained its independence with the Armistice in 1918. As such, it differed from its fellow hyperinflation countries by neither being liable for war reparations to the victorious Allies,[10] nor being branded a pariah state by the surviving Great Powers. Likewise, the country's route out of hyperinflation differed substantially from that of its peers for two reasons. On the one hand, the end of the hyperinflation in 1924 was accomplished out of the country's own resources, without recourse to an external loan; on the other, however, the initial stabilisation of 1924 failed to hold, giving way to moderate inflation in 1925-26. It was not until October 1927 that Poland, this time with the aid of a stabilisation loan, formally entered into the gold standard. These differences call into question the prevailing accounts of Europe's postwar monetary instability— notably those of Sargent (1982) and Eichengreen (1995)— that see in the four hyperinflation countries a common set of causes and policy lessons.

My aim in this paper is to evaluate whether the existing accounts of monetary instability in 1920s Europe provide a sufficient explanation for the case of Poland. To do this, I perform an in-depth analysis of the dynamics of inflation expectations in Poland between 1919 and *de jure* stabilisation of the currency in 1927 on the basis of a previously unexploited data set: daily quotations of the exchange rate between Sterling and the Polish Mark (before revaluation at the end of April 1924) / Zloty (after revaluation) collected from the *Times* of London. Structural break analysis is used to identify turning points in the time series, and Polish and British news sources, as well as papers of the Council of Ministers, Polish State Loan Bank and Bank of Poland from the Polish state archives, are used to attempt to identify the causes of the breaks.

I find that the stabilisation of 1924, almost exclusively the focus of the earlier literature, was preceded by two tentative stabilisations in 1921 and 1922, which lasted for up to eight months before unravelling. Further, I find that the most likely cause of the failure of these early efforts at monetary and fiscal consolidation to hold was not, as Eichengreen (1995) argues, 'wars

[9] Nikolaus Wolf. "Should I Stay or Should I Go? Understanding Poland's Adherence to Gold, 1928-1936," *Historical Social Research* 32, No. 4 (2007).

[10] Poland's war-related liabilities were limited to compensation to the governments of Germany and Austria for government property taken over on account of the new borders. Meanwhile, Poland was— in theory— assigned a share of the reparations payments from the defeated Central Powers, but the sums granted to Poland were negligible compared to those paid to the victorious Allies in the West.

of attrition' between the parties of the Right and the Left over the distribution of the cost of stabilisation across social classes, but the outbreak of border wars in Lithuania and Upper Silesia, which placed an overwhelming burden on the limited resources of the newly formed Polish state. Likewise, the collapse of the Grabski stabilisation in 1925 appears to have been the result not of insuperable distributional conflict but of a premature *consensus* among policymakers that the time had come to shift the focus of economic policy from halting inflation to promoting output, in collision with a further foreign-policy shock in the form of a breakdown in commercial relations with (and via) Germany. Thus, the main reason for Poland's delayed monetary stabilisation after World War I was not indecision by successive governments over the incidence of reforms, but the initially weak state capacity of the reborn Polish Republic, coupled with the willingness of its leaders to subordinate the stability of the currency to the fiscal demands of 'politics by other means'.[11]

2. A Historical Narrative of Poland's Hyperinflation

The existing literature on the monetary history of the interwar period has tended to group Poland, Germany, Austria and Hungary together, with the implication that the similar challenges that they faced sprung from similar initial conditions. For instance, Sargent, while making passing reference to "many differences in details among the Austrian, Hungarian, Polish and German hyperinflations", sees the four countries' experiences as essentially alike in that their hyperinflations were all fuelled by "enormous budget deficits on current account", and ended through the use of "deliberate and drastic fiscal and monetary measures" to engineer a change in the fiscal policy regime.[12] While technically accurate, generalisations of this sort tend to obscure the essential difference in the initial conditions facing Poland *versus* its peers at the close of the First World War.

The difference was this: Germany and the Dual Monarchy of Austria and Hungary entered the First World War as belligerents: states with decades-old political regimes and centuries of unbroken political history; states that possessed the fiscal, logistical and administrative apparatus to put millions of soldiers into the field. The War and the peace that followed it proved greatly disruptive to these polities and their economies. All three of the defeated Central Powers were forced to relinquish substantial territories with considerable economic importance. Germany was compelled, by the Treaty of Versailles, to cede northern Schleswig-Holstein, the important industrial territory of Alsace-Lorraine, and the Vistula valley, which entailed the physical isolation of East Prussia from the remainder of the German state. The Habsburg Empire

[11] The turn of phrase is due to Clausewitz: "War is merely the continuation of politics with other means".
[12] Sargent (1982), p. 43.

fared worse still: having disintegrated *de facto* during the final days of the War, it was broken up definitively by the treaties of Trianon and St-Germain-en-Laye, with the new Austrian and Hungarian states retaining a fraction (in the Hungarian case, less than one-third) of their pre-War territory. The "7000 miles or so of new customs borders across Central Europe" were bound to have a highly disruptive effect on commerce in the region, leading to a dis-integration of markets and even short-term famine, as when the flow of grain from the Pannonian basin to the cities of Lower Austria in exchange for Austrian manufactured goods was cut off in the winter of 1918.[13] To these losses of territory was added the burden of the reparations imposed by the victors on the governments of Germany, Austria and Hungary, amounting in the German case to 132 billion gold marks (or 50 million if the "C" bonds, intended from the beginning more for French public consumption than for repayment, are excluded).[14] Yet in all three cases, despite revolution and, in the Hungarian case, a successful counter-revolution that ended the short-lived Hungarian People's Republic under Bela Kun, the state apparatus and civil administration continued to function, albeit under radically altered conditions.

The situation in Poland was fundamentally different. Poland was not liable for the payment of reparations, for the simple reason that it had not existed as a sovereign entity between the Third Partition of its territory between the Habsburg, Hohenzollern and Romanov empires in 1795 and the very end of the War, on 11 November 1918. That is not to say, however, that Poland was spared the ravages of the fighting. On the contrary, lying as it did athwart the borders of Germany, the Dual Monarchy and Russia, Poland was the battlefield on which most of the war in the East was fought, and it faced as a result a correspondingly high level of devastation.

The damage touched all sectors of the economy, with particularly severe effects on infrastructure and the industrial and agricultural capital stock. Destruction of factories and other sites of productive activity was widespread, such that at the end of 1918, industrial employment in the former Russian territory of Congress Poland (which held the major industrial areas of the Russian partition) was down to 14% of its pre-war level, and the capital stock had been reduced to the levels of the mid-1870s.[15] In agriculture, particularly severe damage was done to the stock of timber and livestock: nearly 300,000 hectares of timberland were lost, the quantity of horses, cattle and swine declined by an average of 40-60% across the provinces of partitioned Poland,

[13] Nikolaus Wolf, Max-Stephan Schulze and Hans-Christian Heinemeier. "On the Economic Consequences of the Peace: Trade and Borders After Versailles," *The Journal of Economic History* 71, No. 4 (2011). Poland also teetered on the brink of famine in 1918-1919, which is one reason why it sought urgent relief credits from the United States in the early postwar years.
[14] Niall Ferguson, "How (Not) to Pay for the War: Traditional Finance and 'Total' War," in *Great War, Total War: Combat and Mobilisation on the Western Front, 1914-1918*, eds. Roger Chickering and Stig Förster (2000).
[15] Zbigniew Landau and Jerzy Tomaszewski. *Gospodarka Polski Międzywojennej: W Dobie Inflacji, 1918-1923* (1967), pp. 64-67.

and the area of land under cultivation was roughly halved.[16] The railways, vital to the re-integration of the war-torn and partition-riven Polish economy, were especially hard-hit, with 41% of major rail bridges, 63% of stations, 48% of rail-yards, 36% of locomotives and 68.1% of the freight rolling stock destroyed from 1914 to 1918.[17] Nor could the human cost of the Great War be ignored: post-war governments faced a legacy of some 400,000 dead (including both military and civilian casualties) and a further 3.6 million internally displaced: they, or their next of kin, all needed to be taken care of.[18] Taken together, the damages suffered as a result of military activity imposed a burden on the Polish economy that the new government of Poland needed immediately to address.

On 11 November 1918, amid the final disintegration of the Central Powers, Marshal Piłsudski, the head of the Polish Legions during the War, arrived in Warsaw from his imprisonment in the German military prison at Magdeburg and took over power from the Regency Council of the German puppet Kingdom of Poland, created in 1916 out of occupied Russian territory. For the first time in a century, Poland became a sovereign state, albeit one with no fixed borders, no regular army, an administrative structure that needed to be built from the ground up, few skilled administrators to run the state apparatus, empty coffers and few ways of filling them in the absence of an effective tax system, and antagonistic relations with nearly all of its neighbours.

The most fundamental problem confronting any attempt to bring the new Polish state into existence as a viable polity was the need to knit together five pre-war territories, each with its own code of laws, system of taxes and tariffs, and economic structure. Moreover, the government that came into existence in November 1918 controlled just one of these territories, centred around Warsaw: the rest had to be bargained or fought for. Thus, the years between 1918 and 1922 saw the government in Warsaw engaged in a series of pitched conflicts, plebiscites held under the auspices of the League of Nations, and backroom dealings at the Paris peace conferences, to define the borders of the Polish state. In the area comprising the pre-war German province of West Prussia, the region of Greater Poland (Posnania) passed *de facto* from German to Polish control as the result of a Polish national uprising in the winter of 1919. The Versailles peace treaty between the Allied powers and Germany of June 1919 then confirmed the facts on the ground by formally assigning this area, as well as a corridor of land up the Vistula to the Baltic, to the Polish state. The major, coal-rich industrial centre of Upper Silesia, before the War a German territory, had its fate decided by three Polish uprisings, contested by German *Freikorps*

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[16] Ibid., p. 153-155
[17] Ibid., p. 224-25
[18] Ibid., p. 36

paramilitaries (August 1919, August 1920, and May-July 1921), as well as a League of Nations plebiscite in March 1921, and the outright intervention of the Quai d'Orsay when those measures had failed to achieve a permanent resolution. To the south, tensions over the industrial region of Teschen led to a brief border war between Poland and Czechoslovakia in January-February 1919, which would poison relations between the two countries for the duration of the interwar period after attempts by the League of Nations to apportion the region via plebiscite foundered in the early months of 1920.[19]

The greatest struggle for the shape of the new-born Polish state, however, took place in the east, where a multitude of states, factions and national independence movement vied to seize as much of the power vacuum left behind by the collapse of Russia into civil war in 1917 as could be had. Freed by the armistice from their bond to the Great Powers under which they had fought during the War[20], the Polish Legions swept westward into the Russian territories of Ukraine and White Russia. The Polish offensive was initially successful, capturing eastern Galicia (before the War an Austrian territory) from the newly constituted People's Republic of Western Ukraine, and sweeping as far east as Minsk and Kiyv by June of 1920.

By then, however, Polish forces were experiencing stiffening resistance from the Red Army, advancing westward into the vacuum from Moscow. A concentrated offensive by Bolshevik forces under Kamenev and Tukhachevsky, with Trotsky and Stalin (who later bitterly remembered his wartime defeat) assigned to the Red Army as its political commissars, succeeded in driving the Poles back to the line of the Vistula. The turning point of the war came on August 15, when the Polish forces, bolstered a French advisory mission under General Weygand, launched a counteroffensive that threw the Red Army back in disarray. Fighting continued for several more months, during which time the Polish army recaptured much of the territory lost the previous summer. The war was ended on March 18 1921 by the Peace of Riga, which granted Poland the territory it had captured in the east (subsequently known as the *Kresy,* or Borderlands), as well as a promised indemnity of 30 million gold rubles, plus the return of railway rolling stock and art treasures looted by the Tsarist regime during the Partitions.[21]

The final addition to Poland's territory during its re-creation had its roots in the October 1920 'mutiny' of General Lucian Żeligowski, during which Polish forces (ostensibly on their own accord, but, in reality, under orders from Marshal Piłsudski) seized the city of Vilnius, which had strong historical and demographic ties to Poland but was claimed by the newly formed Republic of Lithuania as its capital. The city and surrounding area existed for several years as the 'Republic

[19] Nikolaus Wolf. "Path Dependent Border Effects: The Case of Poland's Reunification (1918 - 1939)," *Explorations in Economic History* 42 (2005).
[20] Polish military formations had served during the First World War in the armed forces of Germany, Austria, Russia and (on the Western Front) France.
[21] Landau and Tomaszewski (1967), pp. 8-34.

of Central Lithuania' before being unilaterally annexed by Poland in March 1922. Uncertainty about the territory's status persisted until the Council of Ambassadors of the League of Nations confirmed the annexation in March 1923, and Polish-Lithuanian relations remained frigid, with a totally closed border and no mutual diplomatic recognition, until the late 1930s.[22]

The ongoing and urgent demands of border wars on virtually all sides and the need to replace the one-quarter or so of national wealth that was destroyed in the Great War presented a formidable economic challenge for the new Polish state. Although precise information about government budgets is somewhat difficult to interpret during the inflation years, as late as February 1924, nearly a year after Poland's borders were finalised and five years after the Great War had ended, the special financial advisor to the Polish government E. Hilton Young found that "the budget has been falling into ruins, and it is the army and the railways [the main focus of government reconstruction outlays] that have been responsible for this expenditure". The figures for 1923 cited by Young show a railway deficit amounting to 365.4 million zlotys, and expenditure on the army totalling 369 million zlotys, as against revenues of 426.8 million zlotys and an overall deficit of 692 million.[23]

This situation, in which the two largest items in the budget dwarfed total revenues, was in large part caused by the need to build state fiscal capacity from the ground up by uniting the disjointed regional economies of the reborn Polish state. On the one hand, there was the problem of trade patterns: western Poland (formerly German), Galicia (formerly Austrian) and the Kresy had served before the War as the agricultural periphery of economic networks centred on Berlin, Vienna and St. Petersburg, respectively, while the Kingdom of Poland had been a major supplier of light-industry products, particularly textiles, for the Russian market, from which it had been severed by the Revolution. Only Upper Silesia, which remained outside Poland until 1922, possessed a significant concentration of coal-powered heavy industry.

Recent quantitative research by Wolf (2005) has called into question the long-standing assumption that the partition boundaries presented a severe hindrance to the adjustment of internal trade to new patterns after the war, arguing on the basis of a gravity model that while there was significant disruption, particularly in the short run (in 1926, the effect of the partition borders on intra-Polish trade was roughly the equivalent of a 25-45% tariff, though this impact declined over the 1926-1934 period of the sample)[24], on the whole "interwar Poland was a surprisingly well-integrated economic area" when compared against the benchmark of cross-border trade between present-day US and Canada, and between EU member-states.[25]

[22] Wolf (2005), Landau and Tomaszewski (1967), pp. 8-34.
[23] Edward Hilton Young, *Report on Financial Conditions in Poland* (1924), p. 14.
[24] Wolf (2005), p. 426
[25] Ibid., p. 435

Yet, the finding that the partition borders did not prove an insurmountable barrier to the re-integration of internal trade after independence understates the difficulties that the legacy of partition presented to the organisation of a functioning tax and administrative system. From the beginning, the new government faced several key disadvantages. The first of these concerned the tax structure— or, rather, structures, for the new state inherited four "different and irreconcilable" systems of taxation, each tailored to the needs, currency, and administrative framework of the former partitioning powers, not the unified Poland.[26] Their standardisation into a coherent, well-functioning system was a *sine qua non*, yet it necessarily "meant subjecting a large part of the population to taxes with which they were unfamiliar."[27] Worse, such a thoroughgoing reform took time. For instance, while an external customs regime was implemented by the end of 1919 (a full year after independence), it was not until the summer of 1921 that the internal customs frontiers between the former partitions were abolished (with difficulty and in the face of civil unrest in the relatively prosperous former West Prussia).[28] Full consolidation of the tax administration had to wait until January and June 1922, when West Prussia and Upper Silesia, respectively, were incorporated into the system. An income tax was nominally in place by 1920, but its implementation in the former Russian partition (the largest part of the country) was delayed by several years.[29] As late as 1924, Hilton Young's financial report to the Polish government indicated that the work on reconciling Poland's disparate fiscal regimes was far from complete: "It should be said that a final solution of this problem has not yet been attempted. It is a task that awaits the country in the future."[30] Young was correct: industrial taxation was only unified in 1925, and the final standardisation of the tax structure was not accomplished until 1936.

Compounding the problems raised by the lack of a coherent tax code was the lack of a bureaucratic apparatus, especially outside the capital, through which taxation could be made effective. That this problem was severe, and would take much time and effort to rectify, can be illustrated by the reply Finance Minister Karpiński received when he asked a delegation visiting from the city of Kalisz (250 kilometres from Warsaw, and connected by rail) in April 1919 about the success in that city of the capital levy that had been authorised by the Sejm three months before: "We do not know anything about a capital levy."[31]

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[26] Young (1924), p. 4
[27] Ibid.
[28] Wolf (2005), p. 418
[29] Ibid. p. 417
[30] Young (1924), p. 5
[31] Götz Henning von Thadden, "Inflation in the Reconstruction of Poland, 1918-1927" (unpublished PhD diss., London School of Economics and Political Science, 1994), 59.

Even when the necessary systems of delegation and reporting were put into place, contemporary sources indicate that tax evasion remained a significant concern. This, too, was in part a legacy of partition: as Young notes in his Report, "for four generations [the people of Poland] rightly looked upon the tax collector as the agent of an alien and hated domination, whom it was a patriotic duty to thwart; and a habit learned during four generations is not unlearned in a day."[32] While it is very difficult to quantify the extent to which tax evasion, which is unobservable, contributed to the Polish government's difficulties in balancing the budget during the inflation years, it certainly had an effect, especially during the hyperinflation years when trust in the currency (the Polish Mark, itself a holdover from the partition period) was low and alternative means of payment such as the US dollar, chervonets ruble, and Maria Theresa thaler circulated freely.

If taxation could not be relied on to finance the costs of border wars and economic reconstruction, especially soon after independence when the demands on the budget were greatest and the fiscal capacity least, the Polish government had two conceivable alternatives for financing its expenditures. The first of these was to seek credit, whether at home or abroad. On the face of it, obtaining foreign credits was a desirable solution, as it would have given the government a much-needed breathing space to put together a working system of public finance, as well as provided 'hard' backing for the new currency that would be the permanent replacement for the unbacked Polish Mark inherited from the wartime occupation. Indeed, successive finance ministries in the years after independence made it their priority to attempt to negotiate such a credit, seeing in it a prerequisite for stabilisation.[33]

Unfortunately, the circumstances in which Poland sought foreign relief were inauspicious. Poland, coming into existence for the first time in a century, was the epitome of an 'unseasoned' borrower, with no track record of debt repayment and a pre-Partition legacy of fractious and ineffectual governments that was well-known to potential creditors.[34] It was not even certain, between the border wars Poland was engaged in and the pending deliberations over its future by the great powers at Versailles and elsewhere, whether and under what circumstances the Polish state would continue to exist.[35] With the advent of high inflation, the problem only worsened, as foreign lenders saw in the monetary turmoil confirmation that Poland was a bad credit risk. Thus, Zygmunt Jastrzębski, the finance minister during the latter half of 1922, was reluctantly forced to conclude, toward the end of his term, that "reliance on foreign assistance is, unfortunately, an

[32] Young (1924), p. 5
[33] von Thadden (1994) and Landau and Tomaszewski (Ch. 13) provide a detailed account of these attempts.
[34] To this day, the phrase 'a Polish parliament' is a by-word in Sweden for a dysfunctional government.
[35] For the role of reputation effects and 'seasoning' in determining access to foreign capital, see Michael Tomz, *Reputation and International Cooperation: Sovereign Debt across Three Centuries* (2007).

illusion… foreign assistance will come only when the greatest [economic] difficulties will have been overcome."[36]

As it happened, Poland was able to secure only $286 million in foreign credit between November 1918 and the Grabski stabilisation of January 1924. Of this sum, the bulk consisted of French armaments and US famine-relief credits, with the balance comprising industrial investment, mainly French and British. Between 1918 and 1921 (a period accounting for 98.8% of Polish foreign indebtedness before stabilisation), only 1.26% of all foreign loans granted to the Polish government were able to be directed toward monetary stabilisation.[37] Indeed, the credit constraint remained in force even after the end of the hyperinflation in 1924: while private lending resumed, prior to the formal stabilisation in 1927 the government could float large debt issues only against the security of long-term leases on state monopolies (tobacco, matchstick and alcohol), and predominately from lower-quality lenders, such as the new Fascist government of Italy (in the case of the tobacco loan) and Swedish multimillionaire "genius and swindler" Ivar Kreuger (in the case of the matchstick loan).[38]

Poland's difficulties in obtaining foreign credit were in part self-induced. The issue was not that credit was simply unavailable to Poland, on any terms, but that there was virtual unanimity among the post-independence governments that terms which, as Finance Minister Grabski made explicit, imposed "political or economy-wide" conditions on the Polish government, could not be accepted.[39] Poland could in theory have followed Austria's and Hungary's example in seeking a stabilisation loan from the League of Nations, in exchange for international supervision of its public finances. Indeed, a large loan with significant political preconditions was offered to Poland by the League in February 1925.[40] That all of the Polish governments, before and after the coup of 1926, saw such oversight as too high a price to pay for an early stabilisation of the depreciating currency is one of the distinguishing features of the Polish hyperinflation.

Nor did the Polish government have substantially more success in procuring loans domestically to cover the extraordinary fiscal demands of the postwar period. Capital markets in Poland in the early 1920s were much thinner than those of the US, Britain, or even France and Germany. No large-scale financial centre existed in Poland before the War; capital markets in Berlin, Vienna and St. Petersburg had covered the majority of Poland's finance needs. Only 28 banking institutions, badly weakened by losses during wartime and the revolution in Russia, as

[36] Quoted in Landau and Tomaszewski (1967), p. 308.
[37] Ibid., p. 320
[38] The sobriquet is due to R. Shaplen, *Kreuger, Genius and Swindler*, ed. J.K. Galbraith (Knopf, 1960).
[39] Zbigniew Landau and Jerzy Tomaszewski. *Gospodarka Polski Międzywojennej: Od Grabskieo do Piłsudskiego, 1924-1929* (1971), p. 215.
[40]" Report from the Finance Ministry Delegation to Geneva (Top Secret)," March 1, 1925. Kauzik, box 6. Archiwum Akt Nowych.

well as severance from their pre-war correspondence and discounting networks, existed on the territory of Poland immediately after independence.[41] Inflation, by eroding the stock of real money balances, only worsened the situation, such that financial institutions either lacked the capital to lend and shifted their activities to the safer and more profitable field of currency arbitrage, or lent "for very short periods and at very high rates".[42] Far from being able to draw on the domestic banking system for the funds needed to stabilise the currency, the government felt compelled to "save trade and industry from paralysis" by using the bank of issue to "provide what can no longer be obtained elsewhere", such that, as Young noted in his 1924 report, much of "the trade and commerce of Poland [was being] financed out of credit… made for it by the government".[43]

Meanwhile, the other possible form of domestic credit, borrowing directly from the public through the issue of bonds, also failed to produce satisfactory results during this period. A first attempt was made immediately after independence in 1918, when the government successfully floated a 5% bond issue that raised the equivalent of $75 million for the public coffers. The eight subsequent attempts to repeat this success (three in 1920, one in 1921, and two each in 1922 and 1923), however, disappointed expectations, with no issue raising more than $20 million and the issues during the years of peak inflation raising as little as $4, $1.8, $1.5, and $0.1 million as rampant inflation progressively eliminated the nation's savings. By 1923, even the indexation of the 6% internal loan to gold proved an insufficient incentive to attract more than the equivalent of $7 million to the public coffers.[44]

When the will or the ability to balance the budget was lacking, and credit could not be obtained at politically acceptable terms to cover the deficit, there was one tool of public finance that remained at the disposal of the Polish government: seignorage revenue from the creation of new money, which in effect "places a tax on cash balances by depreciating the value of money".[45] The inflation tax is a potentially desirable tool of public finance, as unlike other forms of taxation it operates automatically and requires for its implementation only a monetary authority willing to authorise the expansion of the stock of money in circulation. In Poland, this requirement was met from the beginning, as the new nation did not possess a central bank with any history of policy independence or commitment to 'sound money'. Instead, the power to issue currency was vested in the *Polska Krajowa Kasa Pożyczkowa* (PKKP), conventionally translated as 'Polish State Loan Bank', but more literally rendered as 'Polish State Loan Fund', a translation that better

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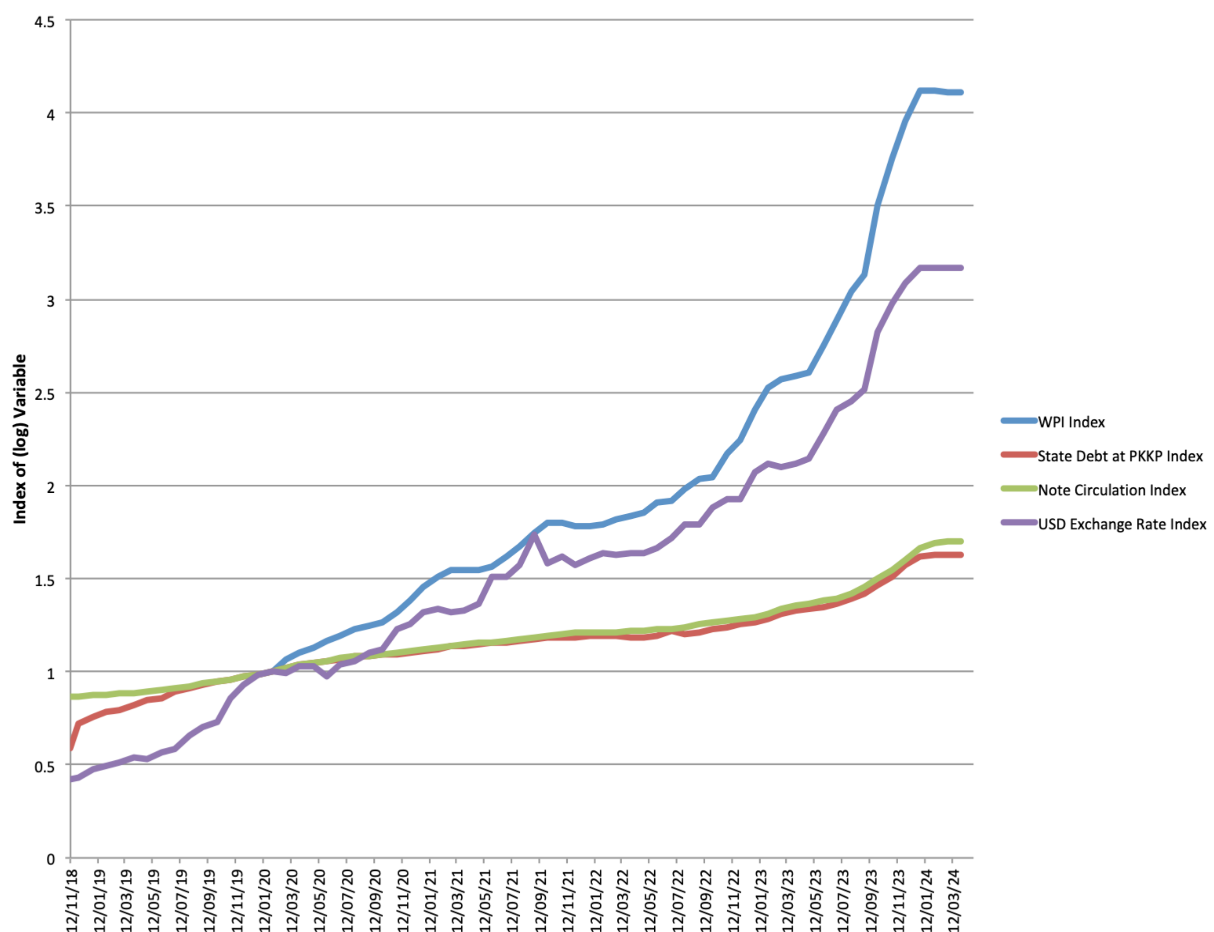
[41] Landau and Tomaszewski (1967), p. 296
[42] Young (1924), p. 11
[43] Ibid., p. 12
[44] von Thadden (1994), p. 93
[45] Philip Cagan, 'The Monetary Dynamics of Hyperinflation', in *Studies in the Quantity Theory of Money*, ed. Milton Friedman (Chicago: The University of Chicago Press, 1956), p. 89.

captures its *ad hoc* nature and core mission: to fund the ongoing expenses of the government. During the period of the German occupation, the PKKP had issued 880 million Polish Marks (MP), of which 520 million had entered into circulation by November 11, 1918. Coming into power, the Polish government used the remaining 360 million, discovered in the PKKP's vaults, to fund urgent expenditures. When this reserve ran out, in January 1919, and with expenditures exceeding revenues by over 300%, the government directed the PKKP to begin the printing of new banknotes, and took to funding its expenditures by taking on credit at the PKKP.[46]

Figure 5. Relative Evolution of (log) Polish Monetary Variables and WPI, Nov. 1918 – Apr. 1924 (Feb. 1920 = 1)



Inevitably, as the note issue expanded, prices began to rise, and the result was runaway price inflation, which began at rates of approximately 15-25% per month, and by early 1923 had crossed the 50%-per-month threshold for hyperinflation proposed by Cagan (1956). While a

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[46] Landau and Tomaszewski (1967), pp. 254-261. Indeed, until the Constituent Assembly established procedures for annual budgeting in 1921, there was no centralised control over government expenditures; each government department possessed an account at the Bank of Poland on which it could draw *carte blanche* to cover its expenses.

'play-by-play' account of the progress of the inflation is beyond the scope of this paper (the interested reader is referred to von Thadden's (1994) well-researched narrative), Table 1 and Figure 5[47] show the evolution, at monthly frequency, of several key monetary variables, as well as an index of wholesale prices, from independence to the establishment of the Bank of Poland at the end of April 1924.

Table 1: Monetary Variables and Wholesale Price Index, November 1918 - April 1924.
Note: Bolded entries indicate a change of more than 50% over the preceding month.

Date	Wholesale Price Index (1914 = 1)	State Indebt. at PKKP (1000s of MP)	Notes in Circulation (1000s of MP)	Price of US$1 in MP (Warsaw)
12/11/18		0	880150	8
30/11/18		**13930**	930457	8.5
31/12/18		**119921**	1024314	9
31/01/19		**209885**	1098147	11
28/02/19		**315000**	1160033	12
31/03/19		400000	1223196	13.5
30/04/19		575000	1345983	15.425
31/05/19		**925000**	1548295	15
30/06/19		1125000	1784564	17.5
31/07/19		**1925000**	2087921	19.65
31/08/19		2525000	2466612	28
30/09/19		3225000	2964709	35
31/10/19		4375000	3723571	41.25
30/11/19		5375000	4236211	**77**
31/12/19		6825000	5316925	110.125
31/01/20		8275000	6719870	144
29/02/20	35.8	10775000	8300261	159
31/03/20	44.5	14775000	10690618	156.125
30/04/20	51.8	19375000	16027865	181.25
31/05/20	57.5	22375000	17934653	180.25
30/06/20	65.0	27625000	21730074	141.75
31/07/20	71.5	33375000	26311387	189.75
31/08/20	80.3	39625000	31085843	214
30/09/20	86.5	40625000	33203498	270
31/10/20	93.5	46925000	38456762	297.5

[47] Data sources for Table 1 and Figure 1: WPI data is given by von Thadden (1994): pp. 184-186. Data on state indebtedness at the PKKP, notes in circulation and the Warsaw dollar exchange rate are taken from Jerzy Zdziechowski, *The Finances of Poland, 1924-1925* (1925), pp. 6-7.

Table 1: Monetary Variables and Wholesale Price Index, November 1918 - April 1924. ***Note: Bolded entries indicate a change of more than 50% over the preceding month.***				
Date	**Wholesale Price Index (1914 = 1)**	**State Indebt. at PKKP (1000s of MP)**	**Notes in Circulation (1000s of MP)**	**Price of US$1 in MP (Warsaw)**
30/11/20	111.5	49625000	43236181	**510**
31/12/20	140.8	59625000	49361485	590
31/01/21	180.5	65625000	55079451	790
28/02/21	222.3	77125000	62560416	890
31/03/21	250.0	93625000	74087403	817.5
30/04/21	251.5	106625000	86755339	820.5
31/05/21	250.8	117625000	94575834	1016
30/06/21	272.8	130625000	102697302	**2075**
31/07/21	328.8	140625000	115242280	2090
31/08/21	401.0	158000000	133734219	2847.55
30/09/21	518.3	178000000	152792056	**6550**
31/10/21	628.5	198500000	182777295	3100
30/11/21	620.5	214000000	207029095	3590
31/12/21	578.0	221000000	229537560	2922.5
31/01/22	578.0	227000000	239615265	3445
28/02/22	607.0	230600000	247209505	4060
31/03/22	663.5	232100000	250665463	3867.5
30/04/22	721.0	220000000	260553764	4075
31/05/22	760.5	217000000	276001108	4002.5
30/06/22	923.0	235000000	300101132	4700
31/07/22	937.0	**360000000**	335426628	6075
31/08/22	1175.0	285000000	385787488	8625
30/09/22	1427.0	342500000	463706046	8865
31/10/22	1500.0	453500000	579972769	**14140**
30/11/22	**2360.0**	519500000	661092352	17320
31/12/22	3079.0	675600000	793437498	17800
31/01/23	**5391.0**	799500000	909160306	**35650**
28/02/23	**8431.0**	1085000000	1177300802	44750
31/03/23	9784.0	**1752000000**	**1841205619**	42300
30/04/23	10481.0	2161500000	2332396794	46625
31/05/23	11130.0	2377000000	2733794112	52875
30/06/23	**18623.0**	2996500000	3566649071	**104000**
31/07/23	**30387.0**	4190000000	4478709058	**196750**

Table 1: Monetary Variables and Wholesale Price Index, November 1918 - April 1924. ***Note: Bolded entries indicate a change of more than 50% over the preceding month.***				
Date	**Wholesale Price Index (1914 = 1)**	**State Indebt. at PKKP (1000s of MP)**	**Notes in Circulation (1000s of MP)**	**Price of US$1 in MP (Warsaw)**
31/08/23	**52408.0**	**6473000000**	**6871776522**	249000
30/09/23	72278.0	**10265000000**	**11197737897**	350000
31/10/23	**276487.0**	**19080500000**	**23080402211**	**1612000**
30/11/23	**679347.0**	**42854000000**	**53217494679**	**3535000**
31/12/23	**1423007.0**	**111332000000**	**125371955360**	**6375000**
31/01/24	**2521667.0**	**238200000000**	**313659830013**	9300000
29/02/24	2484296.0	291700000000	**528913418744**	9250000
31/03/24	2452779.0	291700000000	596244205556	9250000
27/04/24	2423218.0	291700000000	570697550472	9250000

As the trends in Table 1 and Figure 5 show, the majority of Poland's governments between 1918 and 1924 proved unable or unwilling to renounce the use of seignorage to meet fiscal needs. Nevertheless, several Cabinets did make concerted efforts to stabilise the public finances. The existing literature on the Polish hyperinflation recognises four such attempts before the hyperinflation was brought under control. The first of these was engineered by Jerzy Michalski, finance minister from 26 September 1921 to 28 June 1922 in the centre-right government of Antoni Ponikowski. Whereas Michalski's predecessors had faced war and the need to repair extensive wartime damage, by late 1921 Poland's economic and political fortunes were in "an obvious upswing", and it is in this atmosphere that Michalski was able to put together a combination of tax increases, spending cuts (including placement of the army on a peacetime footing) and foreign trade liberalisation aimed at bringing Poland's balance of payments into surplus.[48] These efforts were temporarily successful at halting the growth of, and even slightly reducing, the state indebtedness at the PKKP and the rise in wholesale prices. Nevertheless, by the summer of 1922, the stabilisation unravelled. There is a lack of consensus in the literature on the causes of this turn of events: von Thadden (1994) blames the distributional consequences of the post-stabilisation recession for creating inexorable political pressure for a return to inflationary finance[49]; while Landau and Tomaszewski (1967) are skeptical that the stabilisation was "grounded in reality" in the first place, as the lack of a gold-based unit of account in which taxes could be levied meant that the value of the new taxes would be eroded by inflation during

[48] von Thadden (1994), pp. 123-128
[49] Ibid.

the time-lag between their announcement and collection, such that the reprieve for the public coffers from new taxation was temporary at best.[50]

The failure of the Michalski stabilisation gave rise to a year-and-a-half-long period of almost uninterrupted, and accelerating, growth in the monthly-frequency monetary and price series. Nevertheless, it would be a mistake to classify this period as one of passive helplessness on the part of policymakers, as two further stabilisation drives took place between July 1922 and November 1923. The first of these was carried out by Zygmunt Jastrzębski, Michalski's successor at the Treasury from 3 July 1922 to 4 January 1923 in a succession of conservative cabinets. Though he faced severe political constraints on his freedom to reduce the military budget, a point addressed in detail below, Jastrzębski believed that steps could be taken to create a sound foundation for the public finances, and in particular, to obviate the fiscal time-lag problem that had complicated previous efforts to end reliance on deficit monetisation.

Accordingly, on 27 September 1922, Jastrzębski announced the creation of a new unit of account, the Złoty (literally, 'golden'), equal in parity to the Swiss Franc, in which taxes and expenditures might eventually be reckoned. Unfortunately, a number of flaws, such as the failure of the 8% internal stabilisation loan meant to create backing for the new unit to attract support due to its lack of adequate protection against inflation, marred the execution of this plan. Upon Jastrzębski's departure from office, the zloty remained a mostly 'theoretical' currency: tax receipts and planned fiscal expenditures were reckoned in zlotys, though taxes continued to be levied in Polish Marks.[51] The task of placing the fiscal apparatus on a zloty basis was taken up by his successor in the Treasury, Witold Grabski, who saw in the promise of increased revenues from the valorisation of taxes an easier means of closing the fiscal deficit than the reduction of expenditures, which continued to be high owing to the ongoing demands of defence and reconstruction. With the exception of severe restrictions on dealings in foreign exchange and the issuing of a second gold loan that, by the dismal standards of Polish public finance after 1919, was a success, Grabski failed to persuade the Sejm to back his plan. Parliamentarians, even from his 'home territory' on the centre-right, tended to view the scheme as too complex, and too similar to Jastrzębski's failed scheme to have a realistic chance of success. Grabski's failure to 'sell' his plan to the Sejm prompted him to resign at the beginning of July 1923. Over the following months, however, as inflation continued to accelerate, the Sejm reconsidered the core planks of Grabski's scheme and implemented them: a one-time capital levy, set in zlotys at PLZ 1 billion, was passed on August 11, followed by the full valorisation of the tax system on 30 November.[52]

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[50] Landau and Tomaszewski (1967), p. 269. For the general phenomenon of inflation reducing revenues from non-indexed taxes, see Vito Tanzi, "Inflation, Lags in Collection, and the Real Value of Tax Revenue," in *Staff Papers (International Monetary Fund)* 24, No. 1 (1977).

[51] von Thadden (1994), pp. 128-131.

[52] Ibid. pp. 131-137.

By the final quarter of 1923, the Polish inflation had reached runaway proportions, surpassing the 50%-per-month mark on all of the measures set out in Table 1. While Finance Minister Kucharski stepped up efforts to reform the tax system (as discussed above) and attempted to create room for fiscal manoeuvre by enticing foreign lenders with the collateral of Poland's resource extraction industries (notably timber), a wave of industrial unrest swept the cities. The government (under Prime Minister Witos) attempted to stay the course, with some success, but collapsed on 15 December following the walk-out of a fraction of fifteen Galician peasant deputies from the ruling coalition over the issue of agrarian reform.[53] As the Polish Constitution did not provide for new elections upon the fall of a government, and forming an alternative coalition in the highly fragmented and fractious Sejm proved over the following days to be an impossibility, on 18 December President Wojciechowski asked Grabski to return to his previous post as Prime Minister, at the head of a government of national unity. On 21 December, following a debate described at the time as "the shortest and most good-humoured ever known in the Sejm", the second Grabski government was confirmed by an investiture vote of 193 to 76, which broke down along national, not class, lines, the Polish parties of the centre, right and left voting for the new government; the national minority parties voting against.[54]

Upon being confirmed, Grabski immediately began the implementation of a new, comprehensive programme of financial reform. The Witos government had, on 4 December, announced its scheme for the implementation of a gold-based currency and a new bank of issue. In his manifesto to the Sejm upon returning to office, Grabski endorsed this plan, while supplementing it with a call for further tax increases and expenditure cuts, a new internal loan, and the privatisation of the remaining state-owned enterprises. Most radically, Grabski asked the Sejm to grant President Wojciechowski emergency powers to pass economic legislation including the power to raise up to 500 million gold francs in government loans and to dispose of up to 150 million gold francs of state property.[55] After much debate, on 6 January 1924 the Sejm approved Grabski's special powers bill, the only major change from the original proposal being a reduction of the term of the emergency powers from twelve to six months.[56]

In the six-month window granted by the Sejm, the Grabski government made a number of sweeping reforms to the Polish public finances that ended the hyperinflation for good and laid the foundations of Polish monetary and fiscal policy for the remainder of the interwar period. On the fiscal side, a decree on 28 January established the position of Special Commissioner for

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[53] "Polish Cabinet Resigns," *Times* (London), December 16, 1923.
[54] "New Polish Cabinet Supported," *Times* (London), December 21, 1923.
[55] Ibid.
[56] "Polish Powers Bill Passed," *Times* (London), January 6, 1924.

Economies. February brought reforms to tax collection to protect the Treasury against depreciation and an increase in direct taxes, which was followed by a further increase on March 31; while in April a property tax was established, along with the administrative and assessment bureaucracies needed for its collection. As it would take some time for the new revenue streams to begin to enter the exchequer, the government turned to internal loans as a replacement of deficit monetisation. Of these, the most significant was the dollar loan of 31 January, which had the dual purpose of soaking up the great quantity of US dollars circulating in Poland as a 'hard-currency' alternative to the Polish Mark, and, in so doing, providing the gold-exchange backing for the Złoty, which was to be transformed from mere unit of account into the Polish Mark's permanent replacement.[57]

In the realm of monetary policy, the Grabski government began with the abolition of restrictions on dealings in foreign exchange on 31 January, followed on 3 February by a decree winding up the PKKP, transferring its duties to a committee charged with the creation of the Bank of Poland, and ending the practice of financing fiscal deficits through the creation of new money. Over the following months, the organisational details of the new central bank were worked out. Following the advice of E. Hilton Young, the Grabski government took pains to emphasise that the new Bank, in contrast to the PKKP, would be privately owned and operated, not an agency of the government. The charter of the Bank of Poland established it as a joint-stock institution, with a capital of 100 million Złoty, to be raised via public subscription: the government's initial holding was limited to 1% of the share capital. The Bank's President and Deputy President would be chosen by the President of the Republic, and could be dismissed only for "not fulfilling his duties; or being unable to undertake his post; or combining his presidency with other offices".[58] High-level decisions on Bank policy, such as the raising and lowering of interest rates, were to be undertaken by a twelve-member Council elected by the shareholders.

The Bank's independence was not absolute: notably, Article 26 of the Bank's charter granted the Finance Minister a three-day window to veto the election of any Council member. Indeed, as Chapter 4 of this thesis emphasises, the Piłsudski regime used this means and others to return the Bank of Poland to state control in fact if not in law during the critical years of the Great Depression, 1931-32. Initially, however, Grabski, as Finance Minister, acquiesced in the wishes of the shareholders and "gave permission for the nomination of candidates [to the Council] that he had previously opposed".[59] Nor did the Bank of Poland have exclusive control of the

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[57] Zdziechowski (1925), pp. 20-21.
[58] Zbigniew Landau, "The Relationship Between the Bank of Poland and the Government during the Interwar Period," in *Rebuilding the Financial System in Central and Eastern Europe, 1918-1994,* ed. P. L. Cottrell (1997), pp. 76-77.
[59] Ibid., p. 79.

money supply: the legislation which created it granted it a twenty-year, renewable monopoly on the issue of banknotes—but not coinage, which remained the prerogative of the Treasury.

On 15 April, the Minister of Finance issued the decree bringing the Bank of Poland into existence, and on 27 April, the Złoty replaced the Polish Mark as Poland's official currency, at a rate of 1,800,000 old Polish Marks to the new Złoty.[60] The currency reform was in every sense of the word a monetary and fiscal 'regime change', one which brought a definitive end to the hyperinflation and laid the foundations for the interwar Polish banking system. It did not, however, mark the final stabilisation of the Zloty. On 30 June 1924, the emergency powers granted by the Sejm to the Grabski government lapsed and were not renewed. Whereas Grabski had hoped that, by then, the combination of new taxes and reduced expenditures would be sufficient to balance the budget, in practice a sizeable deficit remained, amounting to 323.6 million Złoty for the year 1924, against a budget of 2.681 billion.[61] Though a vast improvement over the yawning deficits of the hyperinflation period, which at times had exceeded total revenues, this negative balance was obviously unsustainable within the parameters of the Grabski stabilisation.

Yet, the political will to take the final measures necessary to secure a stable currency failed to materialise. Just why this was so is an important question, to which the existing literature gives no conclusive answer. According to von Thadden (1994), the main difficulty was a lack of coordination between the disparate elements of the Grabski coalition. Broad-based as it was, it lacked a unifying economic programme beyond the manifest necessity of ending the hyperinflation. Once that objective had been achieved, however, consensus broke down, and "every attempt at structural reform could have put the government at risk".[62] Inaction, and acquiescence to the deficits that inaction brought, remained as the only alternative. Yet this picture is at odds with the tenor of the contemporary political debate, in which the deficits of 1924-1925 emerge less as a failure to agree on a policy of further austerity than as a deliberate economic strategy. This perspective underpins the report of Jerzy Zdziechowski, Reporter-General on the Budget in Poland's Sejm and chairman of the Sejm's Budget Committee, on *The Finances of Poland, 1924-1925*. Zdziechowski begins by defending the "policy of ruthlessness" undertaken by the government in 1924 to reform the country's monetary and fiscal institutions and thereby bring hyperinflation to an end.[63] Now that hyperinflation had been brought under control, however, he argues that continued austerity is no longer necessary, and, indeed, by "extract[ing] from the productive resources as large amounts as possible, no matter whether they

[60] Zdziechowski (1925), pp. 20-21.
[61] Landau and Tomaszewski (1971), p. 219
[62] von Thadden (1994), p. 150
[63] Zdziechowski (1925), p. 68

could afford such amounts without injury to themselves", would be counterproductive to the nation's economic health.[64] In its place, he outlines a policy to ensure the "increase of production… without reservations and by as ruthless measures as we used to protect the zloty".[65]

The extent to which Zdziechowski's report represents a true programmatic commitment by Poland's government to a positive strategy for further economic development, as opposed to a cover for a lack of agreement in the government on a way forward, remains unclear and is an important question for research. The years 1924 and 1925 were a difficult time for the Polish real economy, as the end of the inflationary stimulus reduced the competitiveness of Poland's exports internationally and hardened the budget constraints faced by firms. The financial sector fell into difficulty as many of the new banks formed during the hyperinflation to exploit the numerous opportunities for arbitrage collapsed.[66] Industrial unemployment rose dramatically, climbing from 67,600 in January 1924 to 251,600 in December 1925.[67]

Viewed in this context, the government's policy programme as expressed the Zdziechowski report may have been disingenuous, intended to cast in a positive light the fact that, beyond addressing the short-term industrial crisis, the parties in Grabski's broad coalition could not agree on an economic programme that imposed a disproportionate share of these heavy sacrifices on their particular constituencies. Yet there is also a case to be made that the government's programme was sincere. Zdziechowski himself points to the deleterious effect the slump in production was exerting on fiscal revenues and advances a supply-side argument based on scale economies that only by increasing the volume of production can Poland become price-competitive on the world market. He thus concludes that the policy of increasing production is Poland's best hope to "maintain the stability of the currency reform that cannot be considered as a complete achievement until we have passed through the present economic crisis."[68]
Further, there is indeed strong evidence that the government saw heavy state investment in this period as a necessary guarantor of Poland's future balance of payments, which in turn was seen as underpinning the stability of the currency.

The crux of the issue was as follows: in the early post-war years, Polish international trade had overwhelmingly gone through the Free City of Danzig (which under the Treaty of Versailles was in an economic union with Poland, though one strained by frequently tense relations between its 90% German population and the Polish government) as well as through Germany. While the Treaty of Versailles had granted Poland five years' preferential access to the German market, these provisions lapsed in January 1925, and subsequent negotiations between Germany

[64] Ibid.
[65] Ibid., p. 69
[66] Landau and Tomaszewski (1971), pp. 230-237
[67] Ibid., p. 90
[68] Zdziechowski (1925), p. 69

and Poland to ratify a replacement agreement broke down over minority rights and the issue of the disputed Polish-German frontier. By the summer of 1925, the two countries were engaged in a full-scale tariff war, which posed a dire threat to Poland's ability to export owing to the lack of a commercial port on the narrow band of coastline over which it held sovereignty.[69]

The Grabski government's response to this threat was to order the construction of a new Polish port at Gdynia, a small fishing village with no pre-existing infrastructure, as well as a rail line linking the port with the industrial heartland in Upper Silesia. Construction of the new port proceeded rapidly, with the volume of freight passing through Gdynia rising from 10,000 tonnes in 1924 to 56,000 in 1925, 405,000 in 1926, and 2.83 million in 1929. The ultimate payoff was large: the proportion of Polish goods leaving by sea rose from 10.5% in 1924 to 45.2% in 1925. Yet so was the up-front investment, which was largely borne by the state treasury due to the ongoing difficulties in securing foreign loans, discussed above.[70]

Whether by inertia or by design, Poland's government between 1924 and 1926 committed itself to running an expansionary fiscal policy in an institutional environment in which a largely independent central bank (i) was committed, *de facto* if not yet *de jure*, to maintaining convertibility between the Zloty and gold at parity with the Swiss Franc; and (ii) held a monopoly on the issue of banknotes and was severely restricted in its ability to grant credits to the government. Clearly, both of these priorities, the fiscal and the monetary, could not simultaneously be sustained.[71] Had the Bank of Poland held complete independence in determining the country's monetary policy, the government would sooner or later have been forced to abandon its pro-growth policy and return to fiscal retrenchment. Yet the government retained one means of monetising its deficits: though it could neither print bills or go into debt with the Bank of Poland, it remained able to mint small change up to an unlimited amount. Thus began the 'coinage inflation' of 1925-1926, in which the government paid for many of its expenditures (including, most notoriously, civil servants' pay) in large quantities of petty coins, whose share in the money supply expanded from 15.6% in June 1924 to 53.2% in December 1925.[72] For reasons that are unclear and deserve further research, the Bank of Poland initially accommodated the increase in the money supply by failing to restrict the supply of banknotes, and a moderate inflation resumed, with wholesale prices rising by approximately 15.2% in 1924,

[69] Landau and Tomaszewski (1971), pp. 277-282
[70] Ibid., pp. 247-249. It should be noted, however, that the railroad portion of the Gdynia project was funded by a French-Belgian-Dutch financial consortium, in exchange for a lease on the revenues of the line.
[71] In theory, foreign credit provided another means of 'squaring the circle'. However, the brief influx of credit following the Grabski stabilisation was not sustained as the Polish economy sank into recession, and large inflows would not resume until the formal stabilisation in 1927.
[72] Landau and Tomaszewski (1971), p. 195

11.1% in 1925, and at an annualised rate of 55.4% from January 1926 to their peak in April.[73] Ultimately, faced with a loss of reserves, the Bank of Poland was forced on 30 July 1925 to suspend the free convertibility of Zlotys into US dollars.[74]

Though the Grabski stabilisation partially collapsed, the reforms put into place in 1924 prevented a renewed slide toward hyperinflation and provided the foundation of the ultimate stabilisation of the Zloty in 1927. Nevertheless, the combination of the Bank of Poland's suspension of convertibility and the deep economic recession marked the end of Grabski's political career. Despite surviving a vote of no confidence in the Sejm on 23 October 1925, Grabski resigned on 13 November, in the face of dwindling support in the Sejm and the ultimate breakdown of commercial talks with Germany. After a week-long cabinet crisis, a new government was established, headed by Count Skrzyński, who tasked Jerzy Zdziechowski, his chosen Minister of Finance, with the task of completing the economic reforms at which Grabski had fallen short.

Despite his previous advocacy for a permissive economic policy that prioritised output over inflation, Zdziechowski proved adept at his new brief. His stabilisation bill, which expanded indirect taxes and cut short the bureaucratic feuds within the government that had hampered previous attempts to balance the budget by assigning each ministry a non-negotiable spending quota, passed the Sejm on 22 December 1925.[75] This measure was fortuitously timed, for it was passed just as the post-stabilisation recession was beginning to lift. By May, the monthly deficit, which had amounted to 22.6 million PLZ, had turned into a surplus, and the fiscal balance would not return to deficit until well into the Great Depression.[76]

The fruits of Zdziechowski's reforms, however, came too late to save his government from collapse. Zdziechowski's programme was passed on the strength of the votes of the pro-business Right. It made few concessions to workers' and agrarian interests, whose power was temporarily at a low ebb owing to the economic crisis, a bad harvest, and their political representatives' association with the Grabski government. While the left-wing opposition did not constitute a majority in the Chamber, they did command much support among the public, and their alienation from the Skrzyński coalition at length called its legitimacy into question. The rise of social tensions in the spring of 1926 provided the backdrop to the return of Marshal Józef Piłsudski to the national stage following his self-imposed retirement after the passage of the 1922 Constitution. Deeply disgruntled with the parliamentary system which he had helped establish but which he now saw as venal and inept, he arrived in Warsaw on 12 May at the head of a loyal

[73] Own calculations, based on data in von Thadden (1994), p. 186.
[74] "Money Market," *Times* (London), July 30, 1925.
[75] von Thadden (1994), pp. 165-167
[76] von Thadden (1994), p. 169; Landau and Tomaszewski (1971), p. 219.

Army division and demanded from the President the resignation of the Cabinet. He was rebuffed, and a small-scale civil war ensued, ending with the formation of a government led by Piłsudski loyalist Kazimierz Bartel, with Piłsudski himself taking the post of Minister of War.

Taking as his slogan *Sanacja,* the "regeneration of the body politic", Piłsudski would spend the remainder of his life working to subvert the institutions of Polish parliamentary democracy while maintaining their facade, until even this remnant of parliamentarism was abolished by the explicitly authoritarian Constitution of 23 April 1935. In so doing, Piłsudski and his government drew on two sources of legitimacy: first, the Marshal's record as a war hero and the founding father of Poland's independence, and, second, the contrast between his government's strong hand on the tiller of the national economy and the (purported) political and economic chaos of the period of parliamentary government on the other. Yet this economic valour was largely stolen: by the time the Piłsudski government achieved power, the parliamentary regime he tarred with the brush of economic incompetence had essentially completed the task of re-stabilising the currency. By April 1926, prices had already reached their peak, and with the budget in surplus little remained to be done apart from the negotiation of a loan to raise the gold-exchange reserves of the Bank of Poland such that they exceeded the ratio required by statute more than twice over, followed shortly by the formal declaration of the Zloty's convertibility into gold on 15 October 1927.

3. Poland's Hyperinflation in the Historiography

The Polish hyperinflation of 1918-1924/27 has been overshadowed in the anglophone economic history literature by the contemporaneous hyperinflations in Germany, Austria and Hungary. Just why this is so is not entirely clear, though language barriers in accessing sources, the limited engagement of Polish scholars behind the Iron Curtain, for political and ideological reasons, with the rational-expectations revolution in macroeconomics, and a general lack of awareness of Eastern European economic— and to a lesser extent political— history among Western researchers, must all have played a part.

Broadly speaking, the existing literature on the hyperinflation in Poland can be categorised under two headings. On the one hand are the works, usually by Polish authors and for a Polish audience (though the work of von Thadden (1994) also falls within this category), that draw almost exclusively on Polish primary and secondary sources and make little attempt to engage with the international literature on money and finance in the interwar period; and on the other comparative works by scholars outside Poland, who tend to interpret the Polish experience as a straightforward case-study that confirms the broader explanation of monetary instability in the wake of World War I that they put forward. The two most influential recent contributions in

the latter category are Thomas Sargent's work on 'The Ends of Four Big Inflations', which stresses the importance of rational expectations, determined primarily by the monetary and fiscal policy of the four hyperinflation's countries' governments, in driving and ultimately halting the explosion in prices; and Barry Eichengreen's view[77], which draws heavily on the work of Alesina and Drazen (1991)[78] in arguing that the timing of stabilisation was determined by the absence of strong majority government and the inability of ideologically opposed partners in the governing coalition to decide who should bear the burden of stabilisation.

3.1 The Polish Hyperinflation Seen from Poland

As seems to be the trend in the monetary and financial history of interwar Poland, the inflation of 1918-1927, though marked at the time by a lively debate between the leading figures of the major schools of economic thought in the country— important contributions were made, for instance, by Edward Taylor[79] and Adam Krzyżanowski[80]— has since 1945 suffered from relative neglect. The state of the art in the Polish historiography thus largely remains defined work of Landau and Tomaszewski, the chief Polish economic historians of the postwar era. These authors take a syncretic view of the causes of the hyperinflation of the Polish Mark, an approach which is not necessarily internally inconsistent, but whose loose engagement with macroeconomic theory contrasts sharply with the sharp-edged hypotheses advanced by Sargent in his *Ends of Four Big Inflations*. Unavoidably, since the authors' main work on the subject dates from 1967 and 1971, Landau and Tomaszewski do not engage with Sargent's rational-expectations view, nor does any of their three approaches bear a close resemblance to it, though their arguments on the political economy of the hyperinflation do bear a family resemblance to those of Alesina and Drazen.

As a first explanation for the catastrophic decline in the Mark's value, the authors clearly identify the monetisation of budget deficits and the granting of large credits and advances to private industry, financed by seignorage, as a major driving force of, and pace-setter for, the hyperinflation. They argue, for instance (in an argument reminiscent of Cagan (1956) on the role of the velocity of circulation in driving hyperinflations), that the ever-growing reliance on increases in the monetary issue over the course of 1923 "was the direct cause of the transition from the phase of inflation to its higher stage— hyperinflation".[81]

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[77] Eichengreen (1995), pp. 100-153
[78] Alberto Alesina and Allan Drazen. "Why are Stabilisations Delayed?," *The American Economic Review* 81, no. 5 (1991).
[79] Edward Taylor. *Inflacja Polska* (1926).
[80] Adam Krzyżanowski. *Pauperyzacja Polski Współczesnej* (1925).
[81] Landau and Tomaszewski (1967), p. 279

Complementary to this view, Landau and Tomaszewski propose a causal channel from the state of the balance of payments to the budget deficit. This is a version of the balance-of-payments hypothesis described, though not endorsed, by Sargent (1982); namely, that due to the damage that the Polish economy had suffered in the war and the requirements of the reconstruction, "Poland imported more than it could have exported". Lacking hard currency, importers in Poland were forced to pay their foreign suppliers in Polish marks, yet due to the deficit in the balance of payments, "foreign traders would agree [to this means of payment] only at an exchange rate substantially below the going rate".[82] In this way, the authors argue, the value of the zloty on the foreign exchange market was driven downwards, which in turn fed back into money creation by increasing the required size of the state budget for imports directed at reconstruction and the required subsidy to enable private firms to cover the cost of raw materials. According to Landau and Tomaszewski, this dynamic was compounded by the flight from the Polish mark as a store of value and means of exchange by domestic actors, who tended to exchange their marks for gold, valuables, and stable foreign currencies; this, they claim, "had an analogous effect on the exchange rate of the Polish mark as purchases of foreign currency to cover imports".[83]

Commenting on the failure of successive governments to bring inflation under control, Landau and Tomaszewski postulate a third root cause of the inflationary process, this time drawing on Marxian theory: reform to stabilise the currency was impossible before January 1924 they say, because "its way was barred by the egotism of the property-owning classes. To wit, reform required large material sacrifices, which they were inclined to make only when the rising activism of the labouring masses threatened their political dominance".[84] On this theory, capitalists benefitted from hyperinflation because, so long as the rate at which the exchange rate fell exceeded the rate at which domestic prices rose, there existed an 'inflationary export premium' that artificially increased the competitiveness of Polish goods on international markets. Only when this premium became eroded by the increasing indexation of prices, wages and taxes to the exchange rate, and when the ongoing economic instability boiled over into "a major intensification throughout 1923 of the revolutionary movement", did the ruling classes become

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[82] Ibid., p. 282
[83] Landau and Tomaszewski (1967), p. 282
[84] Ibid., p. 287. The extent to which this argument reflects the sincere convictions of the authors on the one hand, versus the pressure of censorship by the Communist regime on the other, is debatable. In favour of the former, the authors began their careers at a time when Stalinism was at its height, and Tomaszewski at least was at the time of writing a member of the Polish United Workers' Party. In favour of the latter, there is a sense that certain topics touched on in Landau and Tomaszewski's manuscript were too politically sensitive for open discussion. For instance, the Polish-Soviet War, despite its overriding importance in the new-born nation's economic policy, receives only a brief mention (pp. 18-21), in which the Polish Army is portrayed as an instigator of looting and massacres of civilians, whereas the Red Army is just as unequivocally portrayed as liberators and bringers of self-determination to the workers and ethnic minorities.

convinced that "further maintenance of inflation could lead not only to the economic ruin of the country, but, more importantly, to the erosion of their profits, and even the loss of their power".[85]

In the decades since Landau and Tomaszewski made their contribution to the literature on the Polish hyperinflation, the subject has lain largely dormant in the Polish literature, although contemporary economic commentators and policymakers have occasionally found the period from 1918 to 1927 a useful comparison case to Poland's most recent case of extreme inflation in the late 1980s and early 1990s.[86] The one major exception to this state of affairs is the doctoral dissertation of Götz Henning von Thadden, submitted in 1994 but never published.[87] Though von Thadden was writing from England, his work is a work of 'traditional' narrative economic history that is perhaps best seen as a continuation and updating of the earlier analysis in the Polish literature. Von Thadden delves deeply into the government papers held in the Central Archive of Modern Records (Archiwum Akt Nowych, AAN) in Warsaw to produce an account of the political economy of hyperinflation.

The main contribution of von Thadden's dissertation is twofold. First, whereas Landau and Tomaszewski, in their insistence (whether sincere or otherwise) on the common class interests of the governments of Second Republic Poland, tended to treat the monetary policies of the pre-Grabski governments as essentially very similar, von Thadden meticulously reconstructs the differing policy agendas of the succeeding finance ministers, and demonstrates that several of them— Michalski in 1922-23 and Grabski in 1923—made substantial progress toward stabilisation well before the industrial unrest that, in Landau and Tomaszewski's account, forced the bourgeois elite to put an end to the hyperinflation through which they had hitherto profited. No less important, von Thadden articulates an argument which had perhaps been taken for granted by the earlier Polish literature, but which barely figures in the Western literature: that the Polish hyperinflation was not simply a political failure, but in large part a response to urgent reconstruction and development needs by a state that lacked the administrative and fiscal capacity to meet those needs in any other way. "[T]he state resorted to the printing press", von Thadden writes, "as the only possible alternative of mobilising the necessary funds in an emergency situation… Until the end of the border wars, there was neither politically nor economically an alternative to inflationary finances".[88] While one might question whether certain of the conflicts the reborn Poland was embroiled in were entirely "exogenous to the government"

[85] Ibid., p. 292
[86] For one recent account in this vein, see Zbigniew Polański. "Stabilization Policies and Structural Developments: Poland and the Crises of 1929 and 2008" (2018).
[87] von Thadden (1994)
[88] Ibid., p. 175

and thus simply "the price for Polish statehood"[89]— Żeligowski's seizure of Vilnius on Piłsudski's orders comes to mind— the overall point, that postwar Poland faced pressing needs with an acute dearth of resources, leaving successive governments grasping for desperate measures to square the circle somehow, is difficult to dispute.

Though von Thadden's dissertation is an archetype of diligent archival research, it fails in a number of ways to get beyond the limitations of its Polish forbears. Like its predecessors, its approach is narrative, and whilst von Thadden does include a table of financial data in an appendix, he makes no attempt to test the plausibility of his narrative by confronting it with quantitative evidence in a rigorous way. While von Thadden does more than did Landau and Tomaszewski to argue for the consistency of his narrative with economic theory, he does so with reference neither to Sargent (1981) and Eichengreen (1991)'s (respectively) rational-expectations and political-economy models of the interwar hyperinflations, but instead bases the theoretical portions of his analysis entirely on the theoretical work of Dornbusch, Sturzenegger and Wolf (1990), which surely represents a missed opportunity to bring the preceding Western and Polish explanations for Poland's hyperinflation into dialogue.[90]

Von Thadden's conclusions resemble those of his Polish forebears in that he stresses non-monetary factors in the propagation of the hyperinflation, and, in particular, the role of the balance of trade in imparting a destabilising momentum to prices. In von Thadden's account, the transition from 'merely' high inflation to a self-sustaining hyperinflation occurred as Poland's negative balance of payments caused the exchange rate between the Polish Mark and stable currencies to grow faster than the growth rate of the money supply. Since economic actors, in von Thadden's view, indexed their price and wage decisions to the value of the exchange rate, once the exchange rate became 'dominant' over the money supply, the rise in prices acquired a momentum of its own. Past this tipping point, a credible policy announcement of monetary tightening could not have stopped the Polish hyperinflation. Instead, "strong exchange restrictions [were] vital to combat inflation"[91], as they provided a breathing space in which the permanent solution to the hyperinflation, the establishment of the gold-backed Zloty currency, could be put in place. In essence, then, the theory undergirding von Thadden's analysis is an extreme version of the momentum view forcefully argued against by Sargent (as discussed below), and it is puzzling that von Thadden does so little to defend his interpretation of the Polish hyperinflation against Sargent's highly influential pre-emptive critique.

[89] Ibid.
[90] Rudiger Dornbusch, Federico Sturzenegger and Holger C. Wolf. "Extreme Inflation: Dynamics and Stabilisation," *Brookings Papers on Economic Activity* No. 2 (1990).
[91] von Thadden (1994), p. 180

3.2 The Polish Hyperinflation Seen from the West

In contrast to the Polish authors and their 'spiritual successor' von Thadden, who engage deeply with the historical fabric of the 1920s hyperinflation, the remainder of the Western literature has tended to treat the episode elliptically, presenting it as a straightforward instance of one of several broader narratives of monetary instability in the interwar period. Perhaps the best-known of these approaches is Sargent (1982)'s use of the four European hyperinflations—Poland, Germany, Austria and Hungary— as a historical case-study (my use of the singular here is deliberate) of how economic actors in the real world form expectations of future changes in prices.

Sargent's basic objective is to test the validity of two views of inflation. The first view, which predominated in the macroeconomic literature until the early 1970s, and which explicitly or implicitly undergirds the Communist-era analyses of Polish monetary history, is the 'momentum', or adaptive expectations, theory. On this analysis, economic actors form expectations of future price changes based on the behaviour of prices in the past, basing their choice of prices to set and wages to bargain for in the present period on lagged changes in the general price level. As a result, the rate of inflation adjusts sluggishly to changes in the money supply, and inflation can be reduced only through large changes in output and employment (a high 'sacrifice ratio'), sustained over an extensive period.

However, economic actors need not form their expectations of inflation on the basis of past changes in prices: instead, they may adjust their price- and wage-setting behaviour on the basis of what effect *current* developments, and in particular the fiscal and monetary policy regime currently in effect, are likely to have on the *future* development of prices. If expectations are rational, in the sense that actors use all of the information available to them at time t to *anticipate* price changes at $t+1$, then a credible commitment by the government to a less inflationary fiscal policy should lead to an immediate revision of inflationary expectations downwards by price- and wage-setters. In this way, expectations become self-fulfilling: the rate of inflation immediately falls to its anticipated lower level, and no sacrifice of output and employment is needed to achieve this decrease. The key is credibility: for expectations to adjust, a one-off tightening of monetary policy is not sufficient. Rather, the entire policy regime must shift: "there must be an abrupt change in the continuing government *policy*, or *strategy*, for setting deficits now and in the future that is sufficiently binding as to be widely believed."[92] If such a commitment can be achieved, however, a 'painless' disinflation becomes possible.

The question of whether inflationary expectations are adaptive or rational is thus fundamental to the choice of a monetary policy, and it is in this connection that Sargent examines

[92] Sargent (1982), p. 42

the historical record. He notes that the rational-expectations view of inflation has a number of observable implications that are inconsistent, or at least "difficult to reconcile", with the 'momentum' view.[93] If the stabilisation of the price level occurs abruptly, rather than over a protracted transition period, and particularly if this abrupt halt in the rise in prices coincides with a credible reorientation of the policy regime toward the institutions that place strong limits on the government's ability to expand the money supply, it is reasonable to infer that economic actors are forming their expectations of future price growth in a forward-looking, rational way. This impression would be strengthened if the stabilisation in prices were accompanied by a "rapid rise in the "high-powered" money supply in the months and years after the rapid inflation had ended": if expectations are adaptive, then, all else the same, price changes should always lag, and be of the same sign as, changes in the money supply.[94]

Sargent's results are stark: in all four countries that had experienced a hyperinflation during the interwar period, he finds that, despite the "differences in the details" of the countries' experiences, a common pattern emerges. All four countries ran "enormous budget deficits on current account" during the post-war period, which could be met only by monetisation. The result was an explosive rise in prices, aggravated by a widespread 'flight' into more stable currencies and non-money assets. The growth of prices continued unchecked until a credible set of monetary and fiscal policies that eliminated the government's ability to cover its deficits through the issue of new money. Finally, it was the *announcement* of the monetary and fiscal regime change, not its implementation (which followed with a lag of at least several months) that caused prices to stabilise. In the interim, the governments in question continued to cover their deficits by expanding the monetary base, yet prices remained stable.[95]

Sargent's presentation of the Polish case follows this schema precisely. On his account, the pressures of border wars and reconstruction induced the government to run heavy deficits, funded by increasing the state's indebtedness at the State Loan Bank, through the end of 1923. In January 1924, "a dramatic move toward a balanced government budget and the establishment of an independent central bank that was prohibited from making additional unsecured loans to the government" signalled a credible commitment to ending the monetisation of state deficits. Even though, over the course of 1924, "the note circulation of the central bank increased by a factor of 3.2", there was virtually no growth in the price level and the exchange rate after January of 1924.[96] While unemployment did rise from c. 100,000 to c.150,000 following the stabilisation, Sargent notes that this rise was much less than an adaptive-expectations model would have predicted. As

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[93] Ibid.
[94] Ibid., p. 43
[95] Ibid.
[96] Ibid., p. 65-73

a final piece of supporting evidence in favour of a rational-expectations, credibility-based interpretation of the Polish hyperinflation, Sargent points to the Sejm's grant of emergency powers to Finance Minister Grabski in January 1924 as a major turning point in Poland's experience, though the data at his disposal do not allow him to make a causal argument for the importance of this event.

Sargent's treatment of the Polish hyperinflation remains the definitive account of the period in the published English-language literature. Its limitations, however, are many. At seven *paragraphs* in length, it gives only a basic account of the (second!) Grabski stabilisation, and makes no mention of the earlier efforts to stabilise the currency in 1921/22 and 1923. His analysis takes the large deficits of the Polish state before 1924 as given, and gives no account of their political economy. Perhaps understandably, given the language barrier, Sargent makes no reference to the Polish literature and Polish archival sources, instead relying exclusively on monthly-frequency data on monetary variables taken from the report of a 1925 US Senate commission of inquiry. This low data frequency prevents Sargent from opening the black box of the Grabski 'regime change' and drawing fine-grained conclusions as to which elements, or which combination of elements, was decisive to the success of the Grabski stabilisation— a question with obvious relevance to macroeconomic policy. In sum, while Sargent's contribution to the study of the Polish hyperinflation is valuable, there is much that can be done to extend his analysis with higher-frequency data and deeper use of primary sources.

This is because Sargent's rational-expectations approach to understanding monetary instability in post-World War I Europe focuses on the shifts in policy regime that were instrumental in altering the self-fulfilling inflationary expectations of economic actors by demonstrating a credible commitment to ending the use of seignorage as an instrument of monetary and fiscal policy. Within Sargent's framework, the nature and timing of this 'regime change' are treated as exogenous: Sargent provides no answer as to *why* Grabski in 1924 (but not Grabski in 1923, Michalski in 1922, and all of the preceding heads of the Finance Ministry) was able to carry his programme of reforms to fruition; nor, indeed, why the governments of Austria, Hungary and Germany took as long as they did to balance their budgets and come to terms with their reparations creditors. Indeed, from an economic point of view, the hyperinflations of post-World War I Europe appear thoroughly *ir*rational: the longer a hyperinflation goes on, the higher the costs (in terms of resource misallocation, disruption to financial markets, and sheer inconvenience) to individuals and firms.

Alesina and Drazen (1991) attempt to resolve this paradox by appealing to political economy. As they point out, if one conceptualises the state as a unitary actor, a benevolent "social planner maximising the welfare of a representative individual" (and, implicitly, assumes that the sacrifice in terms of higher taxes and lower expenditure needed to bring inflation under control

is at least as high with prolonged inflation as without it), one would expect stabilisation to occur at the earliest possible moment.[97] Alesina and Drazen propose, then, that the key to understanding why stabilisations, as an empirical matter, are often delayed lies in the fact that governments are often not unitary actors, but coalitions of heterogeneous actors with divergent preferences over the form that stabilisation is to take. (The authors give the example of interwar France, where the firm preference of the parties of the left was to balance the budget via a capital levy, whereas the right postulated a stabilisation based on indirect taxation.) Unless one interest group is able to force its preferred stabilisation plan on the others, there ensues a "war of attrition" characterised by political stalemate and an inability to pass the needed monetary and fiscal reforms.[98] The distributional conflict lasts until the costs of continued inflation to one side come to exceed the costs that they would incur under their opponents' preferred stabilisation plan and they 'concede', allowing their opponents to enact their preferred stabilisation programme.[99] The greater the degree of fragmentation of the political system, Alesina and Drazen predict, the longer it takes for stabilisation to occur.

Though Alesina and Drazen evidently formulated their war-of-attrition model of stabilisation with historical examples in mind, it was Eichengreen, in his 1991 book *Golden Fetters* and several companion papers[100], who most fully exploited its potential as a parsimonious explanation for why so many European countries (including the hyperinflation economies, but also the Nordic countries, the Netherlands, Belgium, France and Italy), having left the gold standard during the war, faced a multi-year struggle to return to it, in many cases even at a parity several times lower than the pre-war one. Eichengreen's key insight is that the political pressures generated by the First World War led, in many western European countries as well as the defeated Central Powers, to far-reaching changes to political institutions, and that these changes, taken together, can naturally be interpreted as a real-life analogue of a destabilising shift in the abstract 'political fragmentation' parameter that is the key explanatory variable in Alesina and Drazen's model.

Specifically, Eichengreen argues that the promises that belligerent governments made to the working classes exchange for their support and sacrifices in what had rapidly become a total war, as well as the spectre of revolutionary movements from the extreme left and the extreme

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[97] Alesina and Drazen (1991), pp. 1170-1174. The bracketed assumption may appear self-evident, but, as will be shown below, von Thadden (1994) questions whether it is appropriate to Poland in the immediate postwar period.
[98] Ibid.
[99] For simplicity, this presentation (and Alesina and Drazen's model, as presented in their paper) considers the case of two opposing parties, which, in empirical terms, is strictly speaking a simplification.
[100] For companion papers, see: Barry Eichengreen. "The Capital Levy in Theory and Practice." In *Public Debt Management: Theory and History*, eds. Rudiger Dornbusch and Mario Draghi (1991), pp. 191–220; Barry Eichengreen. *Elusive Stability: Essays in the History of International Finance, 1919-1939* (1990), pp. 23-56.

right in the immediate post-war period, motivated a widespread opening up of the political process to guarantee a stake in government to parties and groups that had hitherto been politically marginalised. The most common way western and central European governments sought to insure themselves against the currents the Great War had unleashed was thus by adopting "proportional representation electoral systems, in which to win parliamentary seats it was unnecessary for a group to receive a plurality in any one constituency".[101]

As Maurice Duverger recognised in his seminal 1954 study, changing the structure of an electoral system tends to have profound consequences for the size and number of political parties with parliamentary representation. Whereas the mathematical logic of single-member plurality (colloquially but inaccurately known as "first-past-the-post") voting systems tends to allocate seats among a small number of parties, and thus promotes single-party majority governments, proportional representation tends to result in numerous parties represented in parliament, with governments most often taking the form of coalitions between multiple parties of heterogeneous interests. (The latter is particularly likely to be true when, as was typical in the 1920s, before the lessons of Nazism had made themselves felt, there is no vote-share threshold a party must meet to obtain seats in parliament.)[102]

This increased fragmentation in the ten European countries (Belgium, Czechoslovakia, Estonia, Finland, France, Germany, Italy, Latvia, Norway and Poland)[103] that moved towards proportional representation after World War I, Eichengreen argues, had consequences in line with the predictions of Alesina and Drazen's war-of-attrition model. The passage of the reforms ushered in coalition governments of diverse and frequently opposing ideologies and interests. When it came to settling on a strategy for closing the budget deficits that had emerged during and after the War, "neither the beneficiaries of government programs nor the prospective victims of the taxes required to finance them were willing to give an inch. The deadlock left government budgets in deficit and central bank printing presses operating at full speed. Only when inflation reached intolerable levels would the compromises needed to resolve the crisis finally be reached."[104]

Does the 'war-of-attrition' hypothesis explain the difficulties Poland faced in stabilising its currency in the years after it regained its independence in 1918? Perhaps surprisingly, this is a question on which the existing literature is virtually silent. In advancing his argument about the relationship between delayed stabilisation in the 1920s and delayed exit from the gold standard during the Great Depression, Eichengreen focuses on the well-studied cases of the major

[101] Eichengreen (1995), p. 93.
[102] Maurice Duverger. *Political Parties, Their Organisation and Activity in the Modern State* (1954).
[103] Eichengreen (1995), p. 93.
[104] Ibid., p. 106

Western European economies. Whereas Eichengreen's treatment of the hyperinflation and stabilisation in Germany, for instance, spans an entire chapter, and considerable space is devoted to the contrasting cases of France and Great Britain, Poland, the second-most-acute hyperinflation of the interwar decades, receives only a few very brief mentions. It is clear, however, that Eichengreen considers the Polish case a straightforward instance of his general thesis. "Belgium, Germany, Italy, France and Poland", he writes, "all labouring under various forms of proportional representation, consequently found it difficult to form stable governments and complete the process of fiscal stabilisation required to restore the gold standard… In Poland the period of governmental and financial instability was brought to an end in 1926 when General Piłsudski's coup d'état imposed a regime that effectively usurped the powers of parliament."[105] Apart from this coincidence in timing of the coup and the stabilisation (which, as shown below, is hardly exact, with the stabilisation preceding the coup by at least a month), Eichengreen's account is too sparse to allow more than a very tentative answer to whether Poland's hyperinflation was the result of a parliamentary 'war of attrition' over the incidence of the costs of stabilisation.

Table 2: Governments of the Polish Second Republic, 1918-1927

Date	Prime Minister	Finance Minister	Ideological Orientation
17/11/1918 - 16/1/1919	J. Moraczewski	W. Byrka	Left (Socialist)
16/1/1919 - 13/12/1919	I. Paderewski	J. Englich (until 4/4/1919); S. Karpiński (until 31/7/1919); L. Biliński.	Centre (Grand Coalition, Socialist Party in Opposition)
13/12/1919 - 9/6/1920	L. Skulski	W. Grabski	Centre-Right Coalition
24/6/1920 - 3/7/1920	W. Grabski	W. Grabski	Centre (Non-Party Caretaker Government)
4/7/1920 - 24/7/1920	W. Grabski	W. Grabski	National Unity Government
24/7/1920 - 20/11/1920	W. Witos	W. Grabski	National Unity Government
20/11/1920 - 6/1/1921	W. Witos	J. Steczkowski (from 23/11/1920)	Centre-Left Coalition
6/1/1921 - 29/5/1921	W. Witos	J. Steczkowski	Centre Coalition

[105] Ibid., p. 95

Table 2: Governments of the Polish Second Republic, 1918-1927			
Date	**Prime Minister**	**Finance Minister**	**Ideological Orientation**
11/6/1921 - 10/9/1921	W. Witos	J. Steczkowski (Resigns 3/9/1921)	Centre Minority Government
17/9/1921 - 4/3/1922	A. Ponikowski	B. Markowski (interim, until 26/9/1921); J. Michalski	Non-Party (Centre-Left) Minority Government
10/3/1922 - 7/6/1922	A. Ponikowski	J. Michalski	Non-Party (Centre-Left) Minority Government
28/6/1922 - 8/7/1922	A. Śliwiński	K. Zaczek (interim, until 3/7/1921); Z. Jastrzębski	Left (Socialist-Agrarian Radical)
31/7/1922 - 11/12/1922	J. Nowak	Z. Jastrzębski	Centre Coalition
11/12/1922 - 28/5/1923	W. Sikorski	Z. Jastrzębski (until 4/1/1923); B. Markowski (interim, until 13/1/1923); W. Grabski	Centre Minority Government
29/5/1923 - 16/12/1923	W. Witos	W. Grabski (until 1/7/1923); H. Linde (until 2/9/1923); W. Kucharski	Centre-Right Coalition
18/12/1923 - 13/11/1925	W. Grabski	W. Grabski	Non-Party (Centre) Minority Government
20/11/1925 - 10/5/1926	A. Skrzyński	J. Zdziechowski	Grand Coalition
12/5/1926		**May Coup**	
17/5/1926 - 1/10/1926	K. Bartel	G. Czechowicz (until 8/6/1926); C. Klarner	Piłsudski Bloc
2/10/1926 - 27/6/1928	J. Piłsudski	C. Klarner	Piłsudski Bloc
15/10/1927	**Poland Adopts Gold Standard**		

The thesis is certainly plausible: the class system inherited from the semi-feudal institutions of the Polish-Lithuanian Commonwealth, the legacy of partition, the presence of Europe's largest Jewish population, and the new state's reclamation in 1919-1920 of areas with Belarusian and Ukrainian ethnic majorities, all of these factors confronted the framers of the Second Republic's constitution with a need to ensure adequate political representation across a

great diversity of social cleavages. The result was a 'five-adjective' (secret, direct, equal, universal and proportional) electoral law that, though intended by its creator, the Socialist leader Jędrzej Moraczewski, to "ensure that political competition will be taken up only by the major parties, which will compete on the plane of ideas", in practice had the opposite result of creating a polity with many small parties, none of which held an overall majority.[106] As Table 2 shows, the period between 1918 and the Piłsudski coup in 1927 was marked by some seventeen distinct cabinets, which with the exception of the unelected transitional government of Moraczewski in 1918 consisted of broad-based coalitions or extra-parliamentary minority governments.[107]

Yet it would be premature to conclude from the coincidence of a fragmented party system and monetary instability that the former was the cause of the latter. Indeed, in presenting his version of the war-of-attrition thesis, Eichengreen glosses over several important points. First, as Table 2 shows, while governments in the pre-coup Second Republic succeeded each other with great rapidity, the Finance Ministry changed hands much less frequently. Second, as the historical narrative given above has made clear, there was very little left for the Piłsudski regime to do in the realm of monetary stabilisation than to declare *de jure* convertibility: the essential work had already been accomplished by the parliamentary governments of Grabski and Skrzyński. Finally, whereas the war-of-attrition thesis implicitly assumes that all the tools needed to achieve a balanced budget exist, and only the willingness to use them is lacking, an essential feature of the Polish experience after World War I, as we have seen, was the need to develop state fiscal, legal and administrative capacity from a very low level.

To what extent war-of-attrition dynamics explain the delayed Polish stabilisation is thus an open question, and the core focus of the present study, which goes well beyond von Thadden's contribution by putting the competing hypotheses about the Polish hyperinflation—whether expectations were rational or adaptive, and whether the worsening of the Polish currency's position can be traced to an impasse in parliamentary decision-making—to a formal quantitative test. Its conclusions, too, differ greatly from those of von Thadden's in that the high-frequency evidence presented here strongly supports the hypothesis that the expectations of holders of Polish currency were rational rather than adaptive, and responded in particular to shocks to the expected future path of the military budget, the largest item in Polish state expenditure.

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[106] Czesław Brzoza and Andrzej Leon Sowa. *Historia Polski 1918-1945* (2006), p. 258.
[107] Data for the table was compiled from Von Thadden (1994), p. 122; Brzoza and Sowa (2006), pp. 232-275; and the *Times Digital Archive* (GaleCengage, 2012).

4. Data Sources and Methodology

4.1 The Data

As discussed above, the existing literature on the Polish hyperinflation provides several, in part mutually inconsistent, narratives as to which factors drove— and ultimately halted— the upward movement of prices. Where the literature has fallen short is in presenting evidence that would allow one to distinguish clearly between these competing explanations. Even Sargent, whose model of the Polish hyperinflation is in many ways the simplest and most clear-cut, is hardly explicit about which factors added up to the 'regime change' that he sees as crucial in halting the hyperinflation, stating only that "the minister of finance [Grabski] was granted broad powers to effect monetary and fiscal reform", and that the stabilisation involved a balancing of the budget and the creation of a new bank of issue.[108]

To a large extent, the failure of these studies to probe deeper into the causes of the hyperinflation is due to the limited amount of data that they had access to, or, indeed, believed was available to bring to bear on the problem. Von Thadden in particular takes a very fatalistic view of the data situation and defends the qualitative cast of his study by claiming that "[t]he basic data could not be much worse for a thesis in modern economic history. The period under discussion offers a whole variety of different sources, but, unfortunately, most of them are of little use to allow quantitative results. The statistics are extremely poor".[109] Indeed, Poland in the years immediately after its independence was hampered by the need to establish a national statistical office and a system for collecting data about the national economy from scratch, under straitened and unstable circumstances. Thus, the data published by the Central Statistical Office (Główny Urząd Statystyczny, GUS) on employment, industrial output, trade flows and other economic matters must, for the period of the hyperinflation, be taken as 'best guesses', and often indicative of conditions only in certain regions of the country. (Upper Silesia is a major omission from the statistical base until mid-1922, for instance.) With regard to monetary variables, the published statistics are somewhat better: as we have seen, the PKKP provided monthly (and, beginning in 1923, thrice-monthly) returns of note circulation and state indebtedness at the bank of issue, whilst the pioneering GUS statistician Tadeusz Szturm de Sztrem worked to develop a range of monthly (and intermittently weekly) wholesale and retail price indices for Warsaw and Kraków beginning in early 1920. In time, these data were re-published by the League of

[108] Sargent (1982), p. 72
[109] von Thadden (1994), p. 19

Nations[110], becoming the state of the art in research on the economic history of post-independence Poland up to the present.

The main dataset used in this paper consists of 2367 quotations of the exchange rate between Sterling and the Polish currency on the London foreign-exchange market. The series begins on 20 July 1919, and consists of sporadic quotations until 13 February 1920, when the quotations begin to be given daily (or, more precisely, every day except Sundays and Bank holidays, when the London exchanges were closed). I collect the data through 18 October 1927, the day the Bank of Poland institutes full convertibility between the Złoty and gold currencies. As all studies have hitherto looked only at monthly data, this is a dramatic improvement in the data quality and allows the application of sophisticated time-series analysis.

The logic for using the exchange rate between the Polish Mark/Zloty and a (relatively) stable currency, the British Pound, as a proxy for expectations of Polish price inflation is straightforward. In an efficient capital market, arbitrage between assets by investors seeking to maximise their expected returns should lead to assets being priced such that their returns, in expectation terms, are equalised. As currencies derive their value from their ability to be exchanged for goods and services, which varies according to the level of prices of the goods that may be purchased with a particular currency, efficient arbitrage implies that the exchange rate between Sterling and the Polish currency should rise or fall in proportion with the expected difference between the rate of growth of prices in the United Kingdom and Poland:

$$(E^e_{£/PL} - E_{£/PL})/E_{£/PL} = \pi^e_{UK} - \pi^e_{PL}.$$

While this relation, which is based on relative purchasing-power parity, is unlikely to hold exactly for the actually-existing, less-than-perfectly-efficient capital markets of the early- to mid-1920s, the out-of-sample evidence given by Christodoulaki et al. (2012)[111] and Christodoulakis (2013)[112] for Greek bonds and the Greek drachma between 1914 and 1929 suggests that asset prices on the 1920s London market reflected expectations to a reassuringly high degree.

The choice of the London market, as opposed to New York or Warsaw, as a source of the data for this study was motivated by several considerations. First, Britain was a major trading partner of Poland's as well as a 'thick' financial market with a strong record of efficient arbitrage

[110] See, for instance, League of Nations. *The Course and Control of Inflation* (1946); *Memorandum on Currency and Central Banks, 1913-1925* (1926).
[111] Olga Christodoulaki, Haeran Cho and Piotr Fryzlewicz. "A Reflection of History: Fluctuations in Greek Sovereign Risk Between 1914 and 1929," *European Review of Economic History* 16, no. 4 (2012).
[112] Nicos Christodoulakis. "Currency Crisis and Collapse in Interwar Greece: Predicament or Policy Failure?," *European Review of Economic History* 17, No. 3 (2013).

dating as far back as the 18th century.[113] While the same conditions (a well-developed financial market, and a large absolute volume of trade with Poland) hold true for New York, the US government, unlike that of Britain, made extensive relief and reconstruction loans to Poland, and there is a risk that the shifting prospects of these loans' repayment, as well as direct financial intervention by the US government in the defence of creditors' interests, may have led to a bias in the dollar-mark/zloty rate. The second major consideration is that, while daily exchange-rate quotations of the Polish currency against the British Pound and US dollar are available from several Polish markets (Warsaw and Kraków), and traders on Polish markets might be expected to be better-informed about the likely evolution of prices in Poland than traders in London, my comparison of Polish exchange-rate figures with the UK series reveals a definite bias to the Polish figures. These discrepancies are most likely caused by the Polish Treasury's persistent attempts to check hyperinflation by means of exchange controls. Indeed, for substantial parts of the period (particularly in July-August 1923, when the hyperinflation was at its height) the Polish government banned all trading in foreign currency on the Polish market. Because these restrictions did not apply to the large quantity of Polish currency that was available on the London market due to the UK's status as a major provider of imports for the Polish market, the present series is likely to reflect expectations of Polish inflation more accurately than the Warsaw exchange rates cited (at monthly frequency) by earlier research, especially the work of von Thadden (1994).

What can this fine-grained dataset tell us about the drivers of Poland's struggle with, and eventually victory over, extreme inflation? Figure 6 plots the logarithm of the exchange rate between pounds Sterling and Polish Marks/Zlotys[114] on the London market. Examination of the data suggests that the increase in the Polish Mark exchange rate in London before the Grabski reforms of 1924 was not monotonic, and that, in contrast to the existing narratives of the Polish hyperinflation which outline a single critical juncture at which hyperinflation could be halted, there existed several plateaux of up to eight months in duration where the value of the currency, as denominated in Sterling, showed little change. These plateaux can be seen most clearly in the three panels of Figure 7, which present the data series at high resolution, along with the structural breaks identified through the generalised Quandt-Andrews approach of Bai and Perron (1997) in the quantitative analysis.

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[113] Larry Neal. "The Integration and Efficiency of the London and Amsterdam Stock Markets in the Eighteenth Century," *The Journal of Economic History* 47, No. 1 (1987); Eric Schubert, "Arbitrage in the Foreign Exchange Markets of London and Amsterdam during the 18th Century," *Explorations in Economic History* 26, No. 1 (1989).

[114] Exchange rates given in Zlotys, as from 2 May 1924, have been converted to MP at the official conversion rate of 1 PLZ = 1,800,000 MP.

Figure 6: Log of the London Exchange Rate on Warsaw (MP/GBP), July 1919 - October 1927

How might these plateaux in the data series be interpreted? One possibility is to look into the contemporary press and examine whether the timing of the stops and starts in the series coincides with significant events in Poland's internal politics, international relations, and economic development. To this end, I draw on the archive of newspaper clippings I have collected from the London 'Times' and the 'Economist', comprising every news item dealing with Polish politics and the Polish economy. For the period of this study, this amounted to 1229 news articles from the 'Times' and 1498 from the 'Economist'. This archive is particularly useful as it gives a solid indication of the set of information that participants on the London market were likely to have possessed.

4.2 Methodological Approach

As has long been recognised in the historical events-study literature, the use of contemporary news sources to furnish a causal explanation for movements in a time series comes with caveats. Charles Calomiris' criticism, though penned in 1988, remains trenchant: "*Ex ante*, news is virtually impossible to identify. In deciding what constitutes news the informed researcher and the contemporaneous press on which he draws will look for news where there is much to be explained, much the same way as the *Wall Street Journal* seems to explain all market

events *ex post* with an R^2 of unity."[115] The coincidence of an event reported in the newspapers and a movement in the time series may be just that— a coincidence; conversely, if market participants correctly anticipate an event before it occurs and adjust their behaviour accordingly, the lack of a significant movement in the series *at the time the event occurs* should not be taken to mean that the event has had no effect on the series. To gain assurance that the narrative one is telling is a probable causal explanation rather than a 'just-so story', a more rigorous procedure is needed.

Since the mid-1990s, several papers in monetary and financial history have attempted to overcome the temptation to interpret the data in an event study in accordance with the researcher's preconceived priors by using econometric techniques to test for structural breaks in the statistical behaviour of the data series. This approach was first applied by Willard, et al. (1995) to identify which events in the American Civil War were seen by investors in 'greenbacks' (US paper currency) on the New York market as reflecting turning points in the Union's probability of winning the war (after which, it was hoped, the US government would redeem the greenbacks).[116] In subsequent years, the development by Bai and Perron (1998, 2003)[117] of sophisticated econometric algorithms to test for the presence of multiple structural breaks in a time series has laid the foundation for an extensive literature examining the effect of historical events on expectations of financial returns, as reflected in financial asset prices. Notable papers applying this methodology to the economic history of the first half of the 20th Century include Frey and Kucher (2000)[118] and Waldenström and Frey (2007)[119], on the probability of the outbreak of, and German victory in, World War II, implied by the prices of German sovereign bonds on neutral markets; Mitchener et al (2015), which uses sovereign bond prices to assess turning points in civil wars[120]; and Christodoulaki et al. (2012), which also uses bond prices to examine international perceptions of Greek creditworthiness between 1914 and 1929.

The review of the chronology and of Poland's political and economic situation in Section II is a useful beginning to the task of understanding the forces underlying the pattern of structural

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[115] Charles Calomiris. "Price and Exchange Rate Determination During the Greenback Suspension," *Oxford Economic* Papers 40, no. 4 (1988).
[116] Kristen Willard, Timothy Guinnane and Harvey Rosen. "Turning Points in the Civil War: Views from the Greenback Market," *The American Economic Review* 86, no. 4 (1996).
[117] Jushan Bai and Pierre Perron. "Estimating and Testing Linear Models with Multiple Structural Changes," *Econometrica* 66, no. 1 (1998); "Computation and Analysis of Multiple Structural Change Models," *Journal of Applied Econometrics* 18, no. 1 (2003).
[118] Bruno Frey and Marcel Kucher, "World War II as Reflected on Capital Markets," *Economics Letters* 69, no. 2 (2000).
[119] Daniel Waldenström and Bruno Frey. "Did Nordic Countries Recognize the Gathering Storm of World War II? Evidence from the Bond Markets," *Explorations in Economic History* 45, no. 2 (2008).
[120] Kris Mitchener, Kim Oosterlinck, Marc Weidenmier and Stephen Haber. "Victory or Repudiation? Predicting Winners in Civil Wars Using International Financial Markets," *Journal of Banking & Finance* 60 (2015).

breaks identified below. More must be done, however, to obtain reassurance that the quantitative framing amounts to more than window dressing on a 'just-so' story, which, to paraphrase Calomiris, explains the past *ex post* with an R^2 of unity. To assuage these concerns, I collect additional, direct evidence on Polish monetary and fiscal policy, and the decisions and rationales underlying Poland's policy stance. Some of this evidence is quantitative, consisting of data on government budgets (at up to monthly frequency) and the balance-sheet returns of the Polish State Loan Bank and Bank of Poland (initially published monthly, and from March 1922 once every ten days). Another part is qualitative, drawing on the papers of the Polish Cabinet (particularly the Economic Committee), the Treasury, and the two successive banks of issue to provide direct evidence on why monetary and fiscal decisions were made, and, conversely, why it proved so difficult for stabilisation to take hold.

5. Results

5.1 Headline Results

In the main quantitative exercise of this paper, I use the Bai-Perron method for identifying structural breaks to test for the presence of turning points in the series. I then rely on qualitative and archival evidence, as well as lower-frequency quantitative data on fiscal revenues and expenditures to attempt to explain the break points identified by the series and propose a narrative interpretation of the results. My choice of test parameters follows the standard conventions of the quantitative events-study literature: I use 10% trimming (i.e. I require the interval between two structural breaks to be at least 10% of the series in length), and allow the distribution of errors to differ across breaks.[121] As can be seen from Figure 7 and Table 3, the Bai and Perron method identifies seven structural breaks in the exchange-rate data. Figure 7 is split into three panels in order to show the data at high resolution, with the splits corresponding to the several critical junctures (at the second and fifth structural breaks), identified through research in the Polish archives and international financial press, which form the scaffolding for the detailed presentation of the results in Sections 2.5.2-2.5.5.

Reassuringly, using different parameters does not alter the essential results: while moving to 15% trimming mechanically reduces the number of breaks identified (as 15% trimming allows for no more than five structural breaks to be identified), reducing the trimming to 5% reveals no additional breaks. All of the breaks identified are significant at well above the

[121] Waldenström and Frey (2007), p.114 justify their choice of these parameters by citing the preceding literature.

1% level, with the most prominent break, at 8 January 1924, having a test statistic of 12623.72, as against a 5% critical value of 9.1.

As will be discussed at length below, all of the structural breaks identified are associated with Polish events that provide a plausible explanation for them. The concern might be raised, however, that the algorithm may be picking up the effect of developments in the British economy on the exchange rate series, given that it was not until 1925, a year after the end of Poland's hyperinflation, that Britain re-joined the gold standard after having left it during the First World War. To exclude this eventuality, in my survey of the financial press I examined the period around each structural break not only for Polish events, but for British ones as well, finding no plausible British events that could serve as an alternative explanation. In one case, that of April 1923, there was relevant British financial news in that the British budget showed a greater-than-expected surplus[122], but as the characteristic of the series to be explained in that case is a strengthening, not a weakening, of the Polish Mark against Sterling, this occurrence introduces no difficulty for the analysis. Reassuringly, major British political events, notably the 1922, 1923, and 1924 general elections, have no discernible influence on the exchange-rate series, strengthening the conclusion that it is overwhelmingly Poland-specific factors that are being picked up by the algorithm.

As regards the possibility that the timing of the end of the Polish hyperinflation was determined by the successful stabilization of the German currency, rather than the vote of emergency powers to Grabski that constitutes this paper's explanation, while a psychological link between investors' perceptions of the two currencies is certainly plausible, the timing strongly suggests that a *direct* link is unlikely. The crucial portion of the stabilization in Germany was accomplished with the adoption of the *Rentenmark* as a temporary unit of account on 16 November 1923 and the promotion of Hjalmar Schacht to head the Reichsbank on 20 November. In Poland, however, November and December of 1923 mark the worst point of the hyperinflation, with explosive growth in prices and the exchange rate, as shown by Table 1. Thus, while the German success in taming the hyperinflation of the Mark may have emboldened Polish policymakers to make their own effort at financial reform, it was only at the moment of the grant of powers to Grabski that this effort, virtually overnight, bore fruit in stabilizing prices and the exchange rate.

Several strong findings emerge from the analysis. First, the presence of multiple breaks before 1924 confirms the result suggested by optical examination of the data series; namely, that there were at least two periods of relative stability during the hyperinflation years at which

[122] "The Budget Outlook". *Times* (London), 4 April 1923.

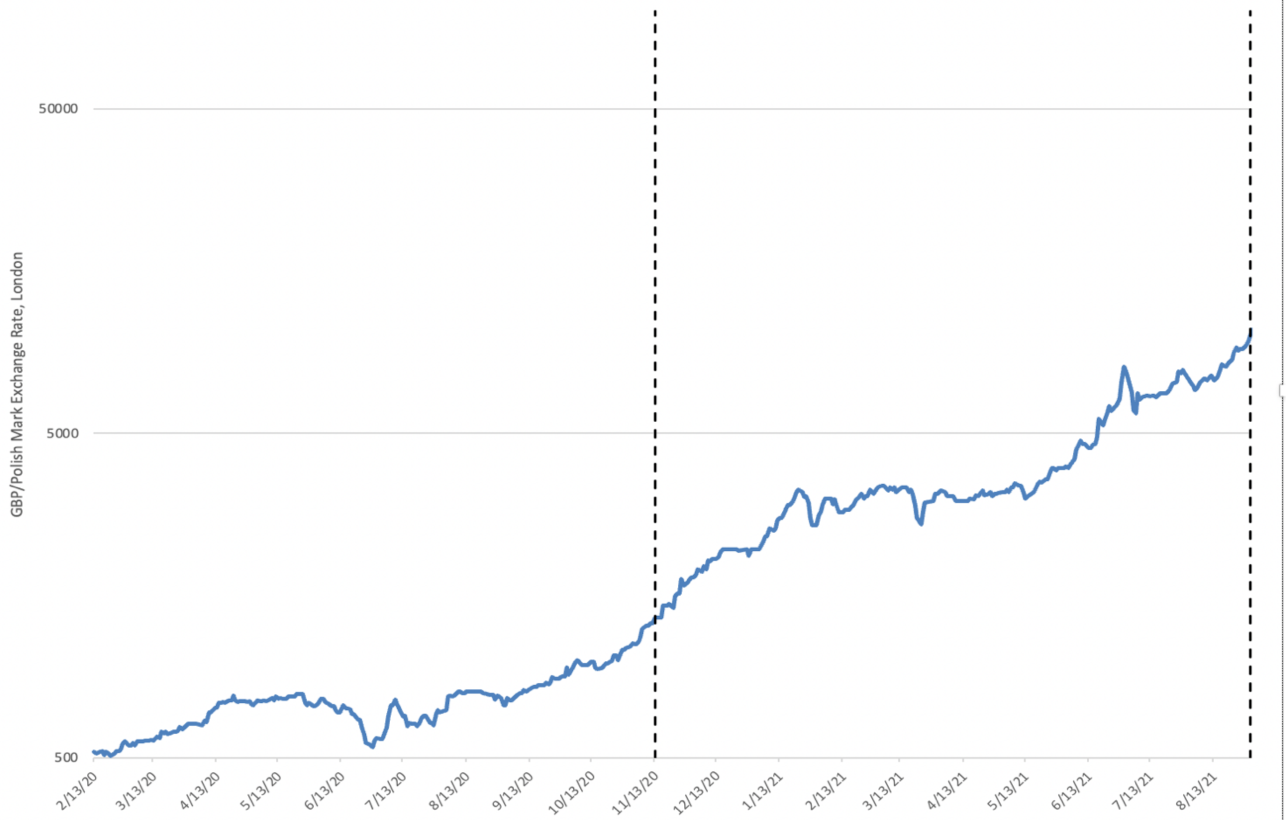
inflationary expectations were temporarily stabilised, before inflation resumed. Von Thadden's argument that the Polish hyperinflation possessed an inexorable momentum which fiscal and monetary policy measures (apart from exchange controls) were powerless against thus appears wide of the mark. Furthermore, the timing of the collapse of the tentative stabilisations of 1921 and 1922 does not coincide with the breakdown of unity in governing coalitions due to a failure to agree on a programme of monetary and fiscal reform, as a war-of-attrition interpretation of the Polish hyperinflation would predict. Rather, it is clearly associated with foreign-policy shocks arising out of Poland's embroilment in the ongoing border conflict with Germany over the Upper Silesian industrial region. Finally, the necessary and sufficient measure (singular) to halt inflation in its tracks was the grant by the Sejm of emergency powers to Grabski to enact economic legislation by decree for a period of six months, in effect giving him *carte blanche* to do anything necessary to achieve currency stability. While Sargent (1981) did not distinguish between the various components of Grabski's stabilisation plan in his analysis, this core result is highly consistent with the spirit of his rational-expectations view of the end of Poland's big inflation: hyperinflation ended the day parliament gave Grabski the means to remove all question of the credibility of his programme of reform.

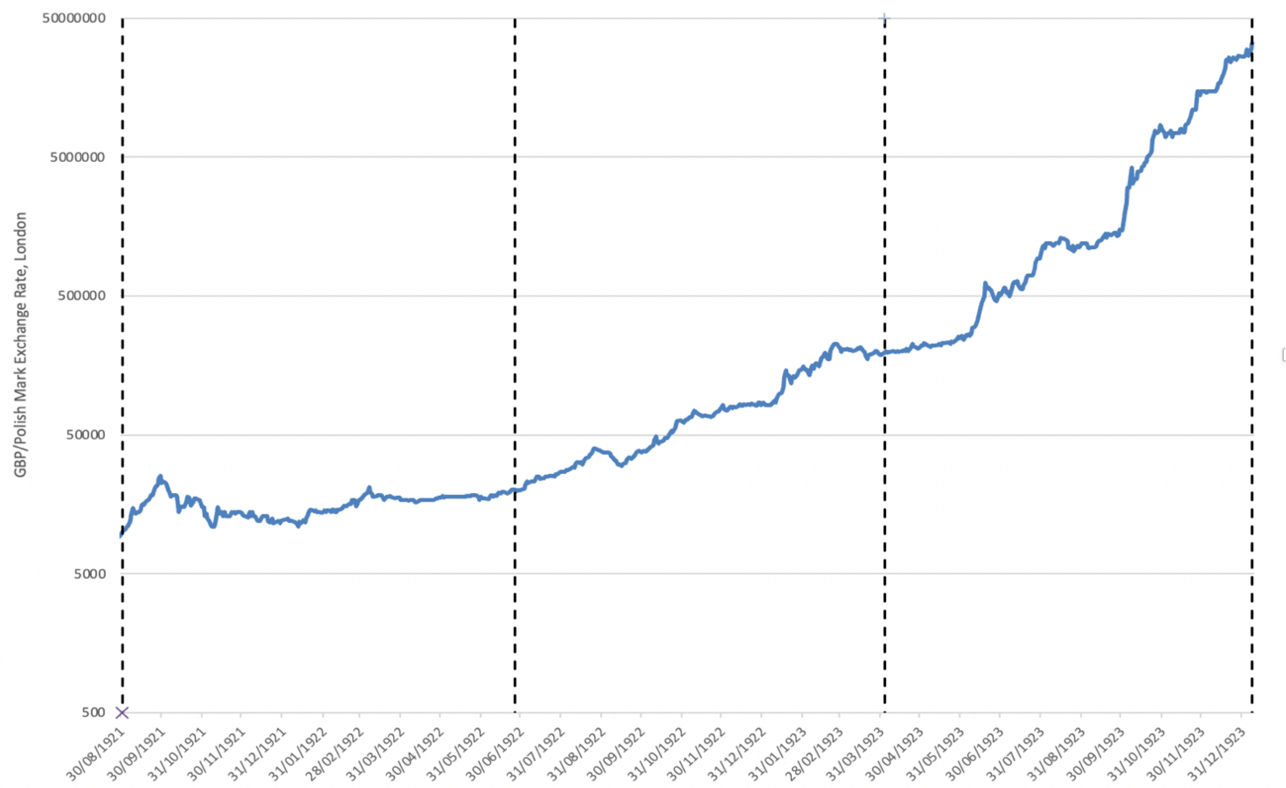
5.2 The First Critical Juncture: Armistice at Riga and the Silesian Crisis

A closer look at the structural breaks found by the Bai-Perron test reveals the outlines of a plausible narrative of Poland's struggle to contain inflation and bring the state's revenues up to a level that could sustain its expenditures. Because of the sixteen-month gap between Polish independence and the first regular quotations of the Polish Mark on the London currency market, the story begins *in medias res*. Much of the detail of the immediate post-war period, encompassing the early border wars and plebiscites and the turbulent emergence of Polish politics is thus lost: the first data point, from 20 July 1919, shows the Polish Mark already at 89.75 to the pound (as against a par value of 25.22[123]), with a steady rise thereafter. Daily data becomes available from

[123] Poland's adoption of the par of the pre-war Latin Union as the intended par value of its currency is not a coincidence, but is closely connected to the great strategic importance to Poland of the alliance with France, and reflects the same desire to keep in step with French policy even in monetary affairs that Wolf (2007), Don-Siemion (2016), and the present thesis all argue played a central part in the Polish decision to remain on the gold standard throughout the Great Depression.

Figure 7: Structural Breaks in the MP/GBP Exchange Rate Series





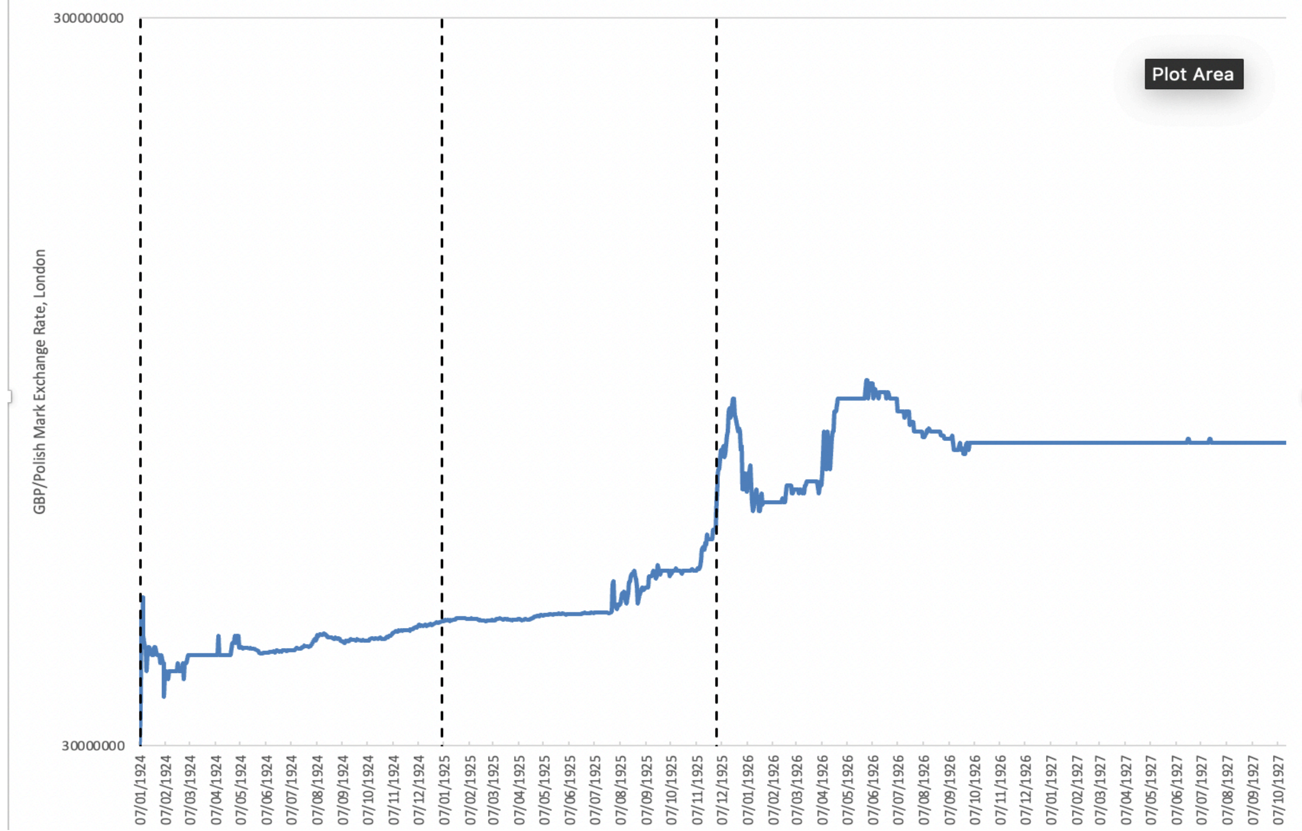


Table 3: Correlation of Structural Breaks in Exchange-Rate Series With Events

Date of Break	F-Statistic (5% Critical Value)	Major Event
13/11/1920	684.11 (13.88)	Armistice between Poland and USSR signed and ratified by Polish Sejm, with provisions made for a gold indemnity to Poland.
31/8/1921	4117.15 (13.45)	Economic unification of Poland (less Upper Silesia) and subsumption of former Prussian territories' revenues into central budget (1 September). Michalski appointed Finance Minister (17 September).
26/6/1922	369.05 (12.97)	Piłsudski uses powers of chief of state to remove Michalski's government over Lower Silesian stance (15 June). Negotiations to form a new government break down (24 June).
3/4/1923	96.47 (12.35)	Grabski, as Finance Minister, introduces financial reforms, beginning with indexation of new taxes to gold and a new internal loan (2 March). Success of internal loan allows note issue to be paused (10 April). (7 April: Midpoint of Grabski's tenure as Finance Minister)

Date of Break	F-Statistic (5% Critical Value)	Major Event
8/1/1924	12623.72 (9.10)	Sejm passes Special Powers Bill granting Prime Minister Grabski powers to govern by decree in economic matters until 30 June 1924. Treasury announces end of paper money issue by 31 January 1924.
5/1/1925	692.84 (11.36)	Not positively identified; transition from slow depreciation to complete stability of the exchange rate, possibly related to release of final, better-than-expected budget figures for 1924 (reported 13 January).
1/12/1925	11407.2 (10.55)	Zdziechowski becomes Finance Minister (20 November). Bank of Poland and Union of Banks intervene in support of the Zloty (1 December). Signature of the Treaty of Locarno (1 December).

mid-February 1920, with the Polish Mark quoted at 520 to the pound and Poland already deeply embroiled in the war with the Bolsheviks in the east.

The Bai-Perron algorithm identifies the first structural break in the series at 13 November 1920. By itself, this is a date of little significance, though it comes not long after the conclusion of an armistice between the Polish and Bolshevik armies on 22 October 1920 and the commencement of peace negotiations between Poland and the Soviet government. A plausible explanation of the odd timing is suggested by Figure 1, which places the date identified by the algorithm at the midpoint of a segment of rapid depreciation too short to be captured by the trimming. This first spate of sharply negative expectations begins in early July 1920, when Poland's fortunes on the battlefield took a dramatic turn for the worse and Poland's army was thrown toward the Vistula, and ends in the second half of January, 1921, when the series plateaus out at roughly 3000 MP to the pound (a level reached on 16 January).

An examination of the progress of the Riga peace talks reveals a likely explanation for the timing of this shift from accelerating to stable prices. Whereas the negotiations were initially conducted under cover of standing armies maintaining their positions at the armistice lines, and occasionally skirmishing beyond them, by the new year negotiations had progressed to the point where "on 7 January 1921, the Polish army was put on peacetime footing for the first time in its existence."[124] Norman Davies, the pre-eminent historian of the Polish-Soviet War, is surely correct in his assessment that this "was the first moment when one can safely say that a renewal of hostilities between Poland and Soviet Russia was not substantially likely."[125] Given that, as of

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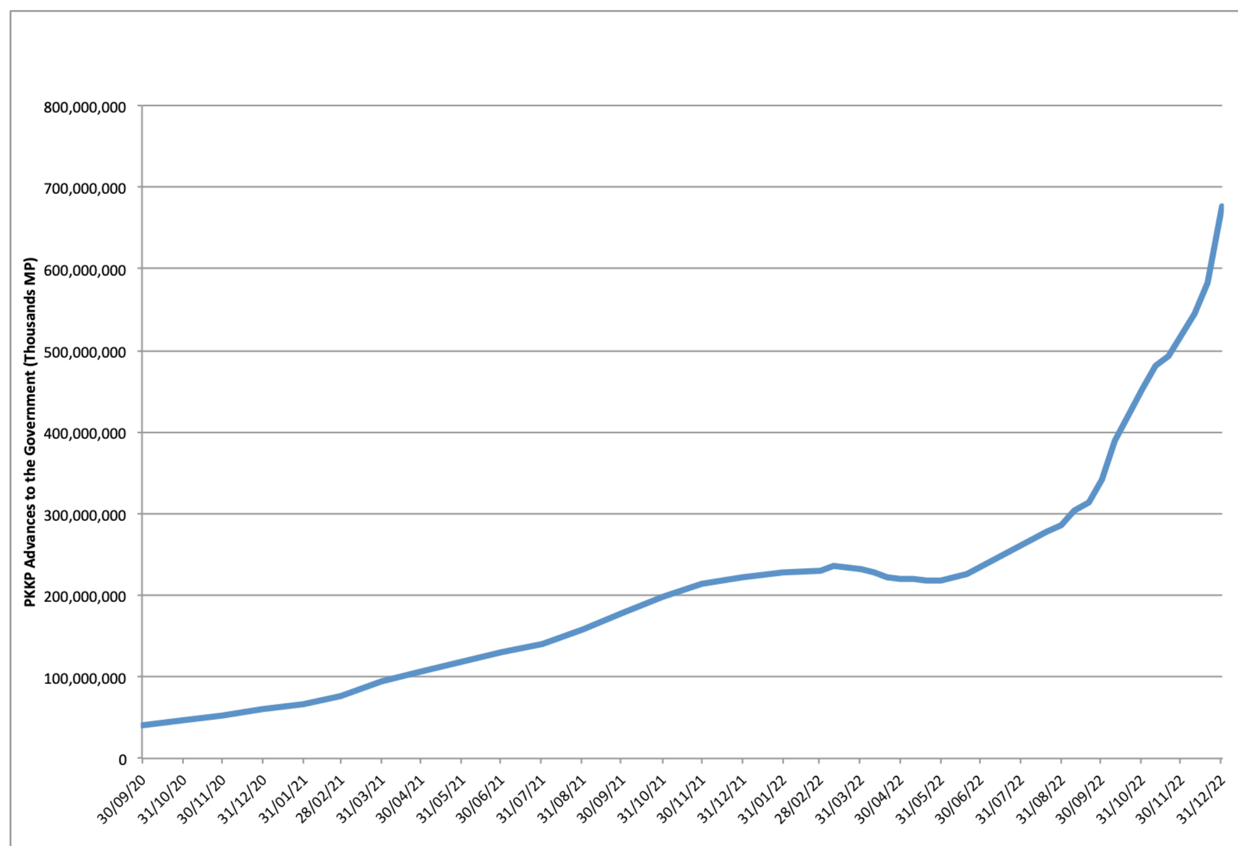
[124] Norman Davies. *White Eagle, Red Star: The Polish-Soviet War 1919-1920* (1972), p. 259.
[125] Ibid.

Figure 8: Central Bank Advances to the Government, thousands MP, 9/1920 - 12/1922



14 December 1920, the Polish government's extraordinary budget (mainly on the war) stood at a deficit of 53 billion MP, as against 7.5 billion MP on ordinary expenditures[126], it is not difficult to see why news of the armistice becoming effective is likely to have had an immediate effect on investors' expectations of future inflation. The slight lag between the Polish decision to stand down the troops and the London market's reaction is probably explained by the slow spread of news: two days from the front to Warsaw, then three from Warsaw to London.[127] A further reason for optimism about a 'peace dividend' to price stability came three weeks later, when the Soviet peace delegation settled on a concrete figure of 30 million gold roubles, to be used as backing for the Polish currency, for the indemnity that Poland had demanded as a precondition for the talks.[128]

A striking characteristic of this first plateau in the data is that whereas the timing of the stabilisation of the Polish Mark against Sterling is exactly coincident with the arrival of good news

[126] "Poland's Finances," *Times (London)*, 17 December 1920.
[127] Figures obtained from comparison of date-lines of articles from Riga and the eastern front for the *Ilustrowany Kuryer Codzienny,* a leading Polish daily newspaper, and thence from Warsaw for the London *Times,* with the articles' publication dates, January 1921.
[128] Davies (1972), 257-58.

from the peace conference, it is neither preceded nor followed by a substantial improvement in the fiscal position of the government. Figure 8, which shows the Polish government's cumulative indebtedness at the State Loan Bank (PKKP), as recorded in the PKKP's balance-sheet returns (published at monthly frequency until the beginning of April 1922 and every ten days thereafter), reveals that state indebtedness continued to rise at the same pace, or even a slightly faster one, after demobilisation as before it. Whence, then, the stability of the Polish Mark? A natural interpretation is the one proposed by Sargent (1981), who suggests that a rising money supply can be consistent with price and exchange-rate stability if expectations are forward-looking and economic actors are convinced that an end to the government's use of seignorage to finance its expenditures is at hand.

This explanation, though plausible, presents something of a puzzle: if actors formed expectations rationally, in response to a credible change in the monetary regime chosen by the government, why did the plateau in inflationary expectations of January 1921 not persist? For a rational expectations view of this first plateau to hold, one would need to argue that the pause in expectations ended as the result of an unanticipated, exogenous shock which undermined the credibility of the government's promises to restore a sound currency as soon as possible.

In fact, the timing of the first period of stability's end points to precisely such an explanation. As Figure 7 shows, the exchange-rate series, virtually flat at approximately 3100 MP to the pound between mid-January and the end of April 1921, begins rising again in the first week of May, reaching 3500 by May 8, 3900 by the end of the month, and 25,500 by the time stability is restored in late September. It is precisely at this time— in the night from May 2 to May 3— that the Third Silesian Uprising, the most severe outbreak of violence on Poland's western frontier since the end of the Great War, began.

The origins of the conflict in Upper Silesia are complex, and a full presentation would range beyond the scope of this article. Briefly, the facts of the case are as follows. Upper Silesia before the Great War was eastern Germany's major industrial region, second in importance in the German Empire only to the Ruhr basin. The region was ethnically heterogeneous, with urban centres inhabited by both Germans and Poles, but with a German majority, surrounded by tracts of countryside inhabited mostly by Poles. The industrial development of the region during the Wilhelmine period had bound the region together into a series of tightly linked supply chains that cut across ethnographic divisions. A partition of the territory according to the principle of national self-determination endorsed by the victorious powers at Versailles was thus doomed to require heavy compromises on two accounts. Not only would any conceivable border leave hundreds of thousands of Poles and Germans on the 'wrong' side of the frontier, and subject to rule by a foreign power whose commitment to minority rights could not be perfectly certain; it would also necessarily result in the severance of vital supply chains, causing severe disruption to

the industry which was the region's lifeblood. Worse still, the ethnographic and economic desiderata of the final settlement were in tension: short of awarding the entire region to one party or the other, any ethnographically fairer settlement was likely to be more economically irrational, placing the cut between Poland and Germany closer to the heart of the industrial area.

The architects of the Treaty of Versailles sought to resolve the Upper Silesian dilemma by submitting the question to the population of the contested area via a plebiscite. The vote, delayed until March 1921 due to the political instability of the area, including two uprisings by the local Polish population against the local German administration's unequal treatment of the Polish population in the plebiscite area, created no obvious way forward. While most of the major industrial towns voted, in many cases with large majorities, to remain in Germany, the surrounding countryside— including a swathe of territory to the west separating the German-speaking parts of the coal basin from the bulk of Germany— declared themselves in favour of union with Poland. In the face of this unclear outcome, the Inter-Allied Commission overseeing the plebiscite, made up of representatives of the United Kingdom, France, and Italy, failed to reach a consensus on the division of the territory. After a month's deliberation, the Commission published two radically divergent plans for the region's future. One, representing the vision of the French representatives on the Commission, sought to place virtually the entire industrial area and surrounding countryside in Polish hands; the other, preferred by the United Kingdom and Italy, offered the Poles only a fragment of the agricultural area, and none of the industrial district.

Fearing that the Inter-Allied Commission would eventually reject the French proposal in favour of the British one, the Polish nationalist politician Wojciech Korfanty, a Silesian native and the leader of the pre-war Polish grouping in the German Reichstag, called on the Polish population of Upper Silesia to rise up and create facts on the ground which would force the Entente powers to adopt the French scheme for the Polish-German border. The uprising broke out in the night of May 3, and proceeded swiftly: within a week, the insurgents had gained control of virtually the entire area up to the ethnographic frontier, and placed the eight urban centres which they failed to capture outright under blockade. Hamstrung by the Treaty of Versailles' limitation of the size of the Reichswehr to 100,000 combat troops for the entire territory of Germany, the Weimar government was initially caught off-guard by the scale and ferocity of the outbreak. Rather than see the region pass out of their hands without a fight, the German authorities called in the right-wing *Freikorps* paramilitaries, consisting of demobilised elements of the wartime German Army, to contest the Polish advance.

While the German decision to suppress the uprising by relying once more on paramilitaries with pronounced anti-system leanings would eventually contribute to the corrosion of the structures and legitimacy of the Weimar Republic in the face of the Nazi challenge, its immediate onus was on Poland. Faced with an escalating conflict over a strategically

vital region, whose manufacturing capacity eclipsed that within Poland's existing borders, and no longer tied up in the Polish-Soviet War, which had obviated Polish efforts to lend support to the previous risings in Upper Silesia, the Polish government felt compelled to furnish Korfanty's insurgents with supplies, matériel, and military advisors. In the face of this pressure, the strenuous efforts which Finance Minister Steczkowski had been making since demobilisation in the east to slash government payrolls and balance the budget went by the wayside. As open war with Germany moved from probability to likelihood, the centrepiece of the government's austerity efforts— the demobilisation of "sixty per cent. of the soldiers, 25 per cent. of officers, and 50,000 of horses" planned for the spring— had to be called off.[129] As Figure 8 shows, the late spring and summer of 1921 saw the government redoubling, not tapering off, its use of the State Loan Bank's credit facilities. While an armistice between the Polish and German combatants came into effect on 5 July, the situation remained tense into August, the participants having drawn lessons from the collapse of the previous effort at a truce in May.

5.3 The Michalski Stabilisation and Piłsudski's 'Crime' of 1922

The Third Silesian Uprising upended the Polish government's efforts to move the state budget into balance and adopt a stable currency. The outbreak of violence did not, however, directly lead to hyperinflation. Though inflationary expectations, as captured by the exchange-rate series, rose sharply throughout the summer months of 1921, by September they had stabilised, giving way to a remarkable nine-month plateau in the value of the Zloty lasting until June of the following year. The second and third structural breaks in the series, which date to 31 August 1921 and 26 June 1922, capture the end points of this tentative stabilisation.

As with the demobilisation of January 1921, the timing of the structural breaks points to a plausible explanation. The structural break marking the beginning of the plateau comes within a day of the abolition, on 1 September, of the internal customs barrier between the former German partition (less Upper Silesia, which remained disputed) and the rest of Poland's territory, and the fiscal union of the territories formerly under German rule (again, less Upper Silesia) with the Treasury in Warsaw. This development marked an important turning point for the state budget, as the former Prussian territories possessed a far deeper tax base than the remainder of the country. Not only did they avoid fighting, and thus devastation, during the Great War and Polish-Bolshevik War; they were also the most economically developed areas of the new Polish state, with living standards closer to those in Germany than in the remainder of Poland. Though the region was largely agrarian, the agriculture of the former West Prussia was based on larger landholdings than elsewhere in Poland and was more heavily marketised, providing a larger surplus for the state to extract. All of these factors meant that the region, while still under

[129] "Overseas Correspondence - Poland." *The Economist*, 19 February 1921.

separate fiscal administration, was the only part of Poland to enjoy a budget surplus, and its integration into the fiscal structures of the central government— against the wishes of large swathes of the population of the region, who feared that their prosperity would be used to subsidise an insolvent Treasury in Warsaw indefinitely— provided much-needed relief for the state's coffers.

The move to integrate West Prussia fully into the Polish state was fortuitously timed, for it coincided with steps by the Entente to achieve a final settlement in Upper Silesia and end the military standoff between Poland and Germany. On 12 August, the Council of Ambassadors of the Entente powers began deliberations to arrive at a final settlement of the Upper Silesian dispute. Over the following weeks, the representatives of the British-Italian and French factions arrived at a compromise settlement between the two original proposals, which split the industrial area roughly in half, and roughly along ethnographic lines. (Although the area awarded to Poland contained a substantial minority of Germans, which would prove a perennial sore point in Polish-German international relations, 55% of the inhabitants of what would become Polish Upper Silesia had declared for Poland in the plebiscite.) By a resolution on 12 October, this division was made official and final.

The hope of a favourable settlement in Upper Silesia came too late to save the government of Wincenty Witos, which by the summer of 1921 had lost its parliamentary majority through the defection of the Socialists. The final straw in the beginning of September, with Finance Minister Steczkowski's resignation following the failure of his efforts to acquire a stabilisation loan in London and Geneva. On 10 September, the Cabinet resigned in solidarity with Steczkowski, leaving no clear majority which could succeed it. It is tempting to explain the fall of the Witos government through the prism of the war-of-attrition model: here was a minority government which, upon exhausting the possibilities of a painless stabilisation on the basis of a foreign loan, resigned rather than face the hard choices needed to push through a reform agenda. Yet subsequent events belie this interpretation. The major parties in Parliament resolved the lack of a consensus not by taking a hard ideological line and letting inflation spiral out of control rather than have the opposing parties get their way, but by agreeing to refer their differences to an extra-parliamentary Cabinet appointed by the Marshal of the Sejm and relying on the votes of the Chamber as a whole for support.

The new Cabinet's initial reception in the political press of the day was not cordial, eliciting "a good deal of surprise and not much encouraging comment" in Warsaw. The commentary of the London *Times* is dismissive, its correspondent judging the new government an "unimpressive combination" whose political inexperience betokened rule by "debating society methods rather than the strong and resolute measures such as Polish finances need today if they

are to be saved from wreck".[130] Defying the low expectations, the new government moved quickly to establish its credibility in economic management, through a combination of astute diplomacy and domestic reform. Its first major foreign policy move, upon taking office, was to threaten the Soviet government with the withdrawal of diplomatic relations, should the Bolshevik government fail to transfer to Poland the gold indemnity imposed by the Treaty of Riga.[131] Concurrently, the new finance minister, Jerzy Michalski, announced a wide-ranging fiscal reform aimed at restoring the budget to equilibrium as quickly as possible, including by carrying through the demobilisation of the armed forces which the Silesian outbreak had deferred. Aided by the windfalls of the incorporation of wealthy Upper Silesia and West Prussia into the Polish state's fiscal structures, as well as by the gradual extension of the government's capabilities in levying taxes, Michalski's efforts to end the government's reliance on inflationary finance produced rapid results. Within a week of the government taking office, it had managed to convince the markets of the credibility of its fiscal agenda. From 29 September, the Polish Mark can be seen to appreciate against sterling, rising from 25,500 MP to the Pound at the end of September to 15,000 at the end of October, and it remained at roughly this level for roughly eight months, until June 1922. By the beginning of the new year, the markets' hope that stabilisation was at hand began to be borne out by the actual fiscal results of the Polish state. As Figure 8 shows, from the autumn of 1921 government borrowing at the Bank of Poland slows, and, from February 1922, goes into reverse, with the government repaying its loans and the Bank using the proceeds to retire currency from circulation.

Did the Michalski stabilisation contain the seeds of its own undoing, as Landau and Tomaszewski (1967) and von Thadden (1994) have claimed, and was its failure precipitated by a loss of control over the economy or an inability to agree on a continued course of fiscal reform? If such were the case, one would expect adverse movements in the government's fiscal position and the exchange rate to precede, or at the latest coincide with, the fall of the Ponikowski-Michalski government on 7 June 1922. The fine-grained quantitative evidence reveals a rather different story, and situate the transition from stability to hyperinflation several weeks *after* the government's resignation. The structural-break analysis of the exchange rate series identifies the end of the 1921-22 plateau in the exchange rate as 26 June: not the date of the collapse of the Ponikowski-Michalski government, but two days after the failure of negotiations to form a new Cabinet, which ushered in a seven-month period of extreme Parliamentary instability. (The implications of this protracted impasse for the war-of-attrition hypothesis are discussed below.) Further evidence that the Michalski stabilisation unravelled only after the Michalski government fell is provided by another relatively high-frequency indicator of the government's fiscal position:

[130] "New Polish Cabinet." *Times* (London), 22 September 1921
[131] "To-day's News." *Times* (London), 23 September 1921

its indebtedness to the State Loan Bank, as recorded in that institution's thrice-monthly returns. These show advances to the government declining steadily, from 236 billion MP on 10 March to 217 billion upon the government's fall. This is followed by an increase to 225 billion MP on 20 June, and a drastic rise to 278 billion two months later, which continues unabated until January 1924.

At this point, another argument might be made in defence of the war-of-attrition interpretation of the Michalski stabilisation's end. Even if the Ponikowski government was managing to pay back its liabilities to the PKKP until the moment it fell, it is conceivable, given the context of the recession into which the Polish economy had fallen, that further sacrifices lay ahead if the balanced-budget course was to be maintained. If the government resigned because it foresaw the trouble ahead and balked at the pain which would be required, or, lacking a guaranteed Parliamentary majority, anticipated that the Sejm would reject any further deflationary legislation presented to it, then a version of the war-of-attrition view would continue to be defensible.

Yet the Ponikowski-Michalski government collapsed not due to argument from within over economic policy, but due to an overt and extraordinary intervention by Marshal Józef Piłsudski framing further austerity as a national-security threat, which due to the Marshal's position as interim Head of State with the power to demand the government's dismissal slammed shut the window of opportunity to complete the Ponikowski-Michalski government's efforts at financial regime change toward balanced budgets and a gold-backed currency.

At the critical juncture of June 1922, with Poland's borders still lacking international guarantees, fiscal stabilisation and foreign policy remained inextricably linked. Upon the Ponikowski-Michalski government's arrival in office, combined expenditure on the military and the strategically important railways stood at 49.3% of the total Budget.[132] No programme of financial reform could be credible which did not involve severe reductions in expenditure on the armed forces. In order to be time-consistent as a means of fiscal stabilisation, however, demobilisation required a more restrained foreign policy. This was a fact well-understood by the Ponikowski government, which under the direction of foreign minister Konstanty Skirmunt took a peaceful turn, over the opposition of the Nationalist Right and elements of Piłsudski's old guard. To cite just one illustrative example, in early March 1922, the question of the status of Vilnius, an ancient capital of the Polish-Lithuanian Commonwealth, one of the cradles of the Polish national independence movement, and the birth city of Marshal Piłsudski, came before the Sejm. Despite the strong pressures to give legal form to the facts on the ground and annex the city, the government made its opposition to outright annexation a matter of confidence, and tendered

[132] "Overseas Correspondence - Poland." *The Economist,* 17 September 1921

their resignation (which was rejected by the Sejm) after attempts to find a compromise short of annexation had failed.

Skirmunt's conciliatory course in foreign affairs was tolerable to Piłsudski so long as the Entente, and in particular Poland's ally France, held mastery over the international landscape in Europe. Germany and the Soviet Union's conclusion in April 1922 of the Treaty of Rapallo, which brought Poland's two bitter enemies together in military cooperation to revise the post-Versailles status quo, changed the calculation for the Marshal. On 2 June, Marshal Piłsudski pointedly demanded from the Cabinet an assessment of the implications of the Rapallo pact on Poland's national security and the government's foreign policy. In a secret session that day, the Cabinet resolved, "upon listening to the report of the Minister of Foreign Affairs, that [Poland's] foreign policy must remain absolutely pacific and that, complementary to this requirement, the organisation and system of state administration must remain unchanged. It is necessary to oppose any alarming reports of an immediate danger and to maintain an atmosphere of calm and stability among the public."[133] Piłsudski responded with hostility, and after several days of negotiations in which the government attempted without success to persuade the chief of state to weigh his opposition to Skirmunt's softer line against his own stated desire to avoid a change of cabinet, he forced government to tender its resignation.

5.4 'War of Attrition' or Politics by Other Means?

Throughout June, there followed a series of negotiations between the Sejm and Piłsudski, aimed at forming an alternative government which would be acceptable to both sets of actors. Quickly, however, it became apparent that the gap between the Socialist sympathies and pro-military views of the Marshal on the one hand, and the centre-right majority in Parliament whose opposition to Piłsudski's expansive conception of Poland's international role pre-dated independence, was too wide to be bridged. Direct negotiations broke down on 24 June, coincident with the third structural break with the exchange-rate series, and the crisis became intractable after Piłsudski rejected the Prime Ministerial candidate proposed by the Sejm, the Silesian Nationalist firebrand Wojciech Korfanty. Eventually, a government which both Piłsudski and the Sejm could stomach emerged under Julian Nowak, but its position, lacking the enthusiastic support of either party, was tenuous. Accordingly, its proposals for financial reform contained no mention of budget cuts to the military; rather, the new government pinned all of its hopes on a foreign loan.[134]

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[133] "Minutes (Secret) of the Cabinet of Ministers, 2 June 1922". Akta Prezydium Rady Ministrów, Archiwum Akt Nowych.

[134] "Polish Finance Reform - Government Proposals". *Times* (London), 24 September 1922.

The tepid economic programme of the politically rudderless Nowak government set the tone for the political and economic crisis which followed. New Parliamentary elections at the end of 1922 did not bring an end to the deadlock. One of the Sejm's first duties upon its inauguration in December was to elect a new President to take over the functions hitherto held by Piłsudski. The chosen candidate, Gabriel Narutowicz, was elected in a spirit of optimism that the Polish political system had turned the corner into normalcy. The tensions stirred up by the hostile political atmosphere of the preceding six months could not simply be dismissed, however, and within days of his election Narutowicz was assassinated by a disaffected Nationalist supporter. Elected under the shadow of a gun, Narutowicz's successor Stanisław Wojciechowski lacked the legitimacy to bring about the hoped-for return to stability, and though Piłsudski went into uneasy semi-retirement from the political scene following the 1922 elections, his moral weight as the deliverer of the reborn Poland, and the implicit threat of the military's overwhelming loyalty to him, continued to loom over Poland's politics in four years of parliamentary government which followed.

The dynamics of the Polish hyperinflation between the fall of the Ponikowski-Michalski government in June 1922 and the beginning of the second Grabski ministry in December 1923 do bear some resemblance to the war-of-attrition scenario envisioned by Alesina and Drazen (1991) and Eichengreen (1995). The governments of this period, unlike the Ponikowski-Michalski ministry which preceded them, continued to shy away from the comprehensive reductions in military and rail expenditure, which continue to figure in E. Hilton Young's February 1924 report to the Polish government as the major outstanding challenges of financial consolidation. Instead, the emphasis on policy during this period was on piecemeal, technical fixes— the 'theoretical' zloty, the gradual indexation of the tax system— and the elusive quest for a stabilisation loan in hard currency. The deadlock is reflected in the continuous upward movement of the Polish Mark-Sterling exchange-rate series. Even the most comprehensive push for financial reform, under Grabski between March and May 1923, figures only as a single structural break in the data (the fourth, dated to 3 April 1923). Though Grabski's efforts succeeded briefly at persuading the markets to give his plan a chance, as shown by the small plateau on either side of the structural break, Figure 7 and Table 3 reveal that the effort brought about no fundamental change, even temporarily, in the upward movement of the note issue and state borrowing at the PKKP, and as soon as the plan ran into difficulty in the Sejm, confidence unravelled. Ultimately, as we shall see, a grant of emergency powers to Grabski by the Sejm, authorising him to take any steps needed to resolve the crisis, was necessary for hyperinflation to be brought under control.

Yet despite the superficial similarities, it is difficult to situate Poland's hyperinflation within the right-left model of Alesina and Drazen (1991) and Eichengreen (1995). The

fundamental barrier to stabilisation from June 1922 onward was the disagreement between the Sejm and Piłsudski, not about the distributional incidence of the stabilisation burden between workers and capital, but about the implications of the fact that any credible stabilisation programme would require large cuts in expenditure on Poland's army and military infrastructure. To the extent that the Polish hyperinflation had the cast of a war of attrition, it was a war between two conceptions of Poland's foreign policy. On the one hand was the conception traced by Skirmunt, which accepted a reduced capacity to project power externally as a necessary cost of economic stabilisation; on the other, Piłsudski's vision of a Poland whose security against its German and Russian adversaries depended on its ability to promote its political interests—if necessary through the 'other means' of military action, to use Clausewitz's formulation— throughout the 'Intermarum' (*Międzymorze*) between the Baltic and the Black Sea.

After the elections of December 1922 and the assassination of Narutowicz, the struggle became latent: Piłsudski no longer held the tiller of the Chief of State, but his presence in the background as the *de facto* head of the armed forces exerted a chilling effect— ultimately well-justified, as his periodic outbursts against the Sejm culminated in the coup of 1926— on the scope of fiscal reform, until rampant hyperinflation persuaded the Sejm to grant emergency powers to Grabski regardless. In any event, the distribution of forces within the Sejm did not make the hyperinflation inevitable. Had the Witos government of early 1921, which possessed a Parliamentary majority with which it could have resisted Piłsudski's demands for a more activist course, resisted the siren call of intervention in Upper Silesia, or had the Ponikowski-Michalski government not been undermined in June 1922 by Piłsudski's fears over the Treaty of Rapallo, Poland would have stood an excellent chance to draw down its military and stabilise its currency.

5.5 Credible Commitment and the End of Two Polish Inflations

Ultimately, it was Grabski's reforms that brought the Polish hyperinflation to a close. The structural-break analysis provides robust confirmation of this conventional wisdom: the fifth structural break in the series, corresponding to the Grabski stabilisation, marks a sharp transition between the punctuated hyperinflation of 1919-1923 and the at most moderate inflation of 1924-1927. The break occurs on 5 January 1924 and is extremely statistically significant, with an *F*-statistic of 12623.72 against a 5% critical value of 9.10. In a broad sense, what this break reveals about the Polish hyperinflation is not new: as Sargent argued, the decisive factor in banishing the spectre of exploding prices was the package of monetary and fiscal reforms introduced in the early months of 1924 by Władysław Grabski, which amounted to a definite financial regime change that placed credible constraints on the government's ability to finance its deficits through money creation. With daily-frequency data, however, it becomes possible to identify precisely which of the components of Grabski's reform package were critical for stabilisation. The detailed

results provide strong evidence that Sargent (1982) was correct over von Thadden (1994) in viewing the Polish hyperinflation as a process of rational expectations, in which the emergence of a credible commitment to systemic and monetary policy change was both necessary and sufficient for curbing inflation, rather than a process with substantial 'momentum', in which adaptive expectations entailed that concrete intervention on the foreign-exchange market had to precede stabilisation.

Both Sargent (1982) and von Thadden (1994) point to the establishment by statute of the independent Bank of Poland, in mid-December 1923, as a precondition for the stabilisation of Poland's currency. The data, however, show that news of the establishment of the new Bank of Issue was not sufficient for stabilisation. Neither the announcement by the government on 10 November that currency reform could not be delayed any further and that, therefore, it was the government's priority to replace the PKKP with the permanent Bank of Poland; nor the passage of legislation on 28 November placing all taxes on a gold basis; nor the approval of the Bank of Poland's statutes by the Financial Committee of the Cabinet on 3 December; nor for that matter Grabski's speech on 20 December setting out his programme of reform on 20 December was sufficient to arrest the slide of the 'Polmark'. Its value against Sterling declined from 7,000,000 MP to the pound on 10 November, to 15,000,000 on 28 November, to 25,000,000 on 20 December, to a low of 48,000,000 in early January.

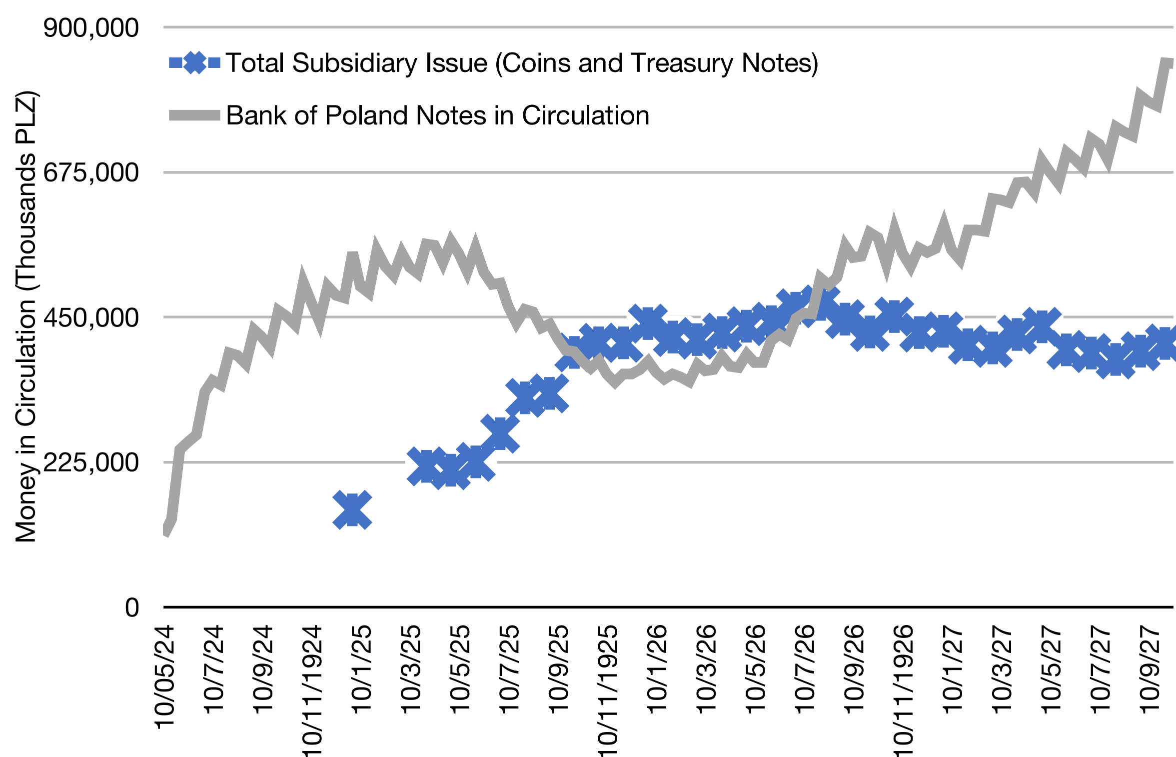
Instead, the structural break marking the transition between the high-inflation and low-inflation regimes during the Grabski stabilisation occurs on January 5, 1924, the trading day after the Polish Parliament voted to give Prime Minister Grabski powers of decree in eleven areas of economic policy, giving him *carte blanche* to take whatever reforms he deemed necessary to ensure the stabilisation of the exchange rate. Far from being a runaway process that only the actual establishment of a gold-backed currency (at the end of April 1924) could arrest, inflationary expectations came to a complete standstill as soon as the government's commitment to balancing the budget was made credible by being placed into the hands of a single, powerful actor. While Sargent's account is limited in that it has scarcely anything to say about the opportunities at which hyperinflation might have been halted before 1924, Sargent's central conclusion is strongly validated by the fine-grained evidence: rational expectations engendered by a credible commitment to a monetary and fiscal regime change were instrumental in restoring stability to the Polish Mark.

As the discussion in Section 2 has made clear, the end of the hyperinflation in 1924 did not mark the final stabilisation of the Polish currency. The story of the Polish experience with moderate inflation after May 1924 is worthy of a separate study, as it presents a fascinating cautionary tale of the chaos which can emerge, not only in the monetary but also in the political

realm, from the existence of two competing monetary authorities with conflicting objectives.[135] On one side was the Bank of Poland, with a statutory monopoly on the issue of banknotes, was concerned with price stability and the maintenance of its gold reserves above the statutory minimum. On the other was the Treasury, which retained its mandate to mint small change and even to issue paper money, which circumvented the central bank's monopoly on note issue through the pretext that the Treasury notes would be redeemable for coins at an indefinite point in the future.[136] As Figure 9 shows, the Treasury abused this power: until December 1925 the circulation of Treasury money increased rapidly, and by November of that year the Treasury issue came to exceed the volume of the Bank of Poland's notes in circulation. For reasons which remain unclear, the Bank of Poland was slow to recognise the threat to its mandate posed by the expansion of the Treasury issue, and was forced to abandon the convertibility of the Zloty to gold-backed currencies on 30 July 1925.

[135] A worthy prolegomenon to such a study is Leszczyńska (2013)'s treatment of the Bank of Poland's policy between 1924-1927, which is the most thorough and analytically original portion of her work.
[136] According to the published returns of the Bank of Poland, the last Treasury notes were retired from circulation in October 1932.

Figure 9: Bank Money and Treasury Money, May 1924 - October 1927[137]



What is interesting in the context of the present paper is the pattern of structural breaks in the exchange-rate series during the period of coinage inflation and what they reveal about the structural forces at work. The sixth structural break, dating to 5 February 1925, is somewhat mysterious, but some understanding of it can perhaps be gleaned from an examination of where it falls in Figure 7C, marking a transition from a very slow depreciation of the Polish Mark toward its par value to a position of stability just short of par, which lasts until the suspension of złoty convertibility by the Bank of Poland. While no news event is prominent enough to identify this structural break with full confidence, it is possible that the structural break is picking up on the publication of a set of budgetary figures on 13 January, which, although they showed a slight deficit, were treated by contemporaries as a vindication of Grabski's policy course— the associated article in the *Times*, for instance, notes that "[a]ctual results very greatly exceeded estimates, especially in the case of indirect taxes and monopolies.[138]

The period of stability that sets in at this time comes to an end with the Bank of Poland's suspension of convertibility in July 1925, with an immediate depreciation of the Zloty to 27.8 to the Pound (from a mid-market price of 25.4, very slightly above the par value of 25.22) the day

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[137] Source: Statistical appendices of *The Economist*, 1924-1927, published monthly and accessed via Gale Cengage, *The Economist Historical Archive.*
[138] "Polish Revenue in 1924," *Times* (London), 20 January 1925.

the suspension comes into effect. Remarkably, however, the data suggest that market participants maintained a degree of faith in Grabski's capacity to complete the stabilisation until the last days of his government, in November 1925. Whereas the wholesale price index of the Polish Institute for Economic Research (*Instytut Badania Koniunktur i Cen*) had increased by 72.6% between May 1924 and November 1925[139], the exchange rate upon the fall of the Grabski government on 13 November stood at 29.875, or just 18.5% above par.[140]

By November 1925, Grabski was caught between was caught between rising popular and parliamentary unrest against further austerity and the diminished fiscal possibilities which the post-stabilisation recession afforded. Though Grabski had freshly acquired a mandate from Parliament for staying the course of financial reform, the breakdown of talks with Germany to end the trade war which had been raging since June and the Bank of Poland's refusal to violate its statutes by extending any further credit to cover the government's deficits proved to be the final straw. The markets' reaction to the departure of the man who had proven his capacity to make systemic changes in favour of financial reform was swift. Over night, the exchange rate fell to 31 Zlotys to the pound, and the depreciation continued over the following weeks— to a low of 50 Zlotys against the pound— with the announcement of Jerzy Zdziechowski, a man who, in presenting the government's budget for 1925, had made his preference for an end to contractionary policy clear.

As we have seen, however, upon arrival in office, Zdziechowski adopted a stance against inflation which was, if anything, more hard-line than his predecessor's. The means by which he did so lend strong support to Sargent's argument that high inflation is defeated by credible signals of changes in the monetary and fiscal policy regime. The seventh structural break in the series, which marks the beginning of the turnaround in Poland's inflationary fortunes, occurs on 1 December 1925. This is the day when the government, in concert with the Bank of Poland and the Union of Banks, announced a package of measures to restore budgetary stability and intervene in support of the Zloty.[141] (It is also possible, though this is difficult to substantiate, that the signature of the Treaty of Locarno that day, helped shore up the Polish currency by rsising hopes to an end to the trade war with Germany.) It appears to be the case that the policy announcement consisted in Zdziechowski committing the government to the same difficult fiscal choices which Grabski had chosen resignation over. On 16 December, the government gave

[139] Data reported in *The Economist's* monthly supplements.
[140] To some extent this discrepancy is accounted for by the Bank of Poland's attempts to prop up the value of the Złoty using its remaining reserves, as argued by Leszczyńska (2013), pp. 149-170. However, the mere fact that this intervention could even be sustained for so long by the feeble force of the Bank of Poland's critically depleted store of foreign exchange, rather than suddenly coming to ruin through a speculative attack of the sort described by Krugman (1979), does imply some degree of residual market confidence.
[141] "Polish Currency," *Times* (London), 4 December 1925.

further substance to its commitments by introducing a sharply deflationary budget for the 1926 fiscal year, including a cut to government expenditure of 25%, with sharp reductions in expenditure on the Army and payroll.[142] From this date, the recovery in the Zloty's value begins in earnest, with the currency rising to 43 Zlotys to the pound by the beginning of January. In spite of some gradual fluctuation thereafter, neither the May coup nor the fall of the Skrzyński(/Zdziechowski) government which preceded it in early May show up as movements in the series, and the parity at which Poland enters the gold standard in October 1927— 43.38 Zlotys to the pound— is effectively the same as that which followed in the wake of Zdziechowski's fiscal announcement. All that was left for the Piłsudski regime to do was to claim credit.

6. Conclusion

In this paper, I have used a new, high-frequency dataset to shed new light on the causes of the Polish hyperinflation, interwar Europe's second-most-severe case of monetary instability. Several conclusions emerge from this new look at the episode.

First, and perhaps most importantly, the pattern of structural breaks in the series strongly suggests that the Polish hyperinflation was not monotonic in nature, as virtually all of the previous literature on the subject has claimed. Rather, there were multiple 'plateaux' in economic actors' expectations of further inflation, persisting for up to six months, moments in time when a permanent stabilisation was—or at least appeared to be— possible. This finding is in direct contrast to the narratives conveyed by Sargent (1982) and Landau and Tomaszewski (1967,1971)— and to some extent also the 'war of attrition' view of Alesina and Drazen (1991) and Eichengreen (1995)— all of whom conceive of a single critical juncture at which the necessary and sufficient conditions for stabilisation were met— either the point at which the distributional consequences of hyperinflation became untenable for one social class or another, or the point at which policymakers instituted a sweeping monetary and fiscal regime change that moved the Polish economy from an inflationary to a non-inflationary equilibrium.

If these views, however, are too simplistic, the impression that remains is one of multiple junctures at which, but for a missed opportunity, some degree of progress toward stabilisation could have been achieved. Most tantalisingly, a strong argument can be made that the Witos government following the Peace of Riga, and to an even larger degree the governments of 1921-22 in which Michalski held the Finance portfolio, could have succeeded in stabilising the Polish currency at an early date, had not the decision to intervene in the Upper Silesian crisis in the former case, and Piłsudski's mutiny over the government's handling of foreign policy in the latter, thwarted their efforts.

[142] "City Notes - Polish Finance," *Times* (London), 17 December 1925

The questions raised by these counterfactual possibilities have potentially profound implications for how Poland's economic record during the interwar period as a whole ought to be judged. In a recent paper, the National Bank of Poland economist Zbigniew Polański argues that the fact that Poland was so badly affected by the Great Depression, but emerged from the global financial crisis of 2008 unscathed, has much to do with the differing lessons and institutions drawn from the hyperinflation of the early 1920s and the early 1990s, respectively.[143] The Polish hyperinflation of the 1920s was allowed to persist for long enough that it eroded the fragile support for a democratic political system; conversely, when Józef Piłsudski seized power in the military coup of May 1926, his regime drew much of its legitimacy from its claim to a "cleansing of the body politic" (*Sanacja*), the tangible symbol of which was the adoption of the gold-exchange standard, the maintenance of which had strongly negative consequences for the Polish economy in the Depression[144], and conceivably, for Poland's chances of resisting German aggression in 1939. The long-standing argument among political historians of interwar Poland over whether the strategic value of the Teschen/Cieszyn industrial region outweighed the damage that Poland's 1938 annexation of it did to Polish-Allied relations in the critical months before the outbreak of World War II thus has an under-appreciated parallel: if the price for Poland's annexation of the coalfields and heavy industry of Upper Silesia in 1922 was a shorter period of prosperity before 1929 and a deeper Depression, would a more cautious foreign policy in the early 1920s have made a difference to the tragic end of the Polish Second Republic?

[143] Zbigniew Polański. "Stabilization Policies and Structural Developments: The Crises of 1929 and 2008". CASE Working Paper (2017).

[144] Zenobia Knakiewicz, *Deflacja Polska 1930-1935* (1967), has hitherto been the pre-eminent work on this subject, which is, of course, the guiding question of the remaining two substantive chapters of this thesis.

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