The "Hierarchy of Institutions" reconsidered: Monetary policy and its effect on the rule of law in interwar Poland

Christopher A. Hartwell [a,b,*]

[a] Department of Accounting, Finance & Economics, Bournemouth University Business School, Fern Barrow, Poole, Dorset, BH12 5BB, United Kingdom
[b] Department of International Management, Kozminski University, ul. Jagiellonska 57-59, 03-301 Warsaw, Poland

ARTICLE INFO

ABSTRACT

Traditional wisdom in economics holds that institutional change runs from political institutions to economic ones, with the distribution of political power affecting the creation of property rights and rule of law. This hierarchy of institutions has been observed in macroeconomic policy, where it has long been understood that there are political incentives for economic mismanagement, namely the creation of inflation. But are there longer-term effects of currency manipulation on the rule of law in a country? That is, does the hierarchy not always hold? This paper answers this question by focusing on a specific case of monetary instability, the newly-independent Second Polish Republic of 1918 to 1939. Using appropriate econometric techniques on a new database of historical data, I find that monetary profligacy correlates strongly with significantly lower levels of the rule of law. This result is robust to several tests and most specifications, including the use of a new variable for measuring access to the political system. The results suggest that monetary instability is a threat to political institutions in its own right, eroding the rule of law in addition to creating macroeconomic difficulties.

"The best way to destroy the capitalist system is to debauch the currency."

– attributed to V.I. Lenin by J.M. Keynes, 1919

1. Introduction

The economic wisdom of the past three decades has downplayed the role of economic institutions in economic outcomes, focusing instead on the role that political institutions play in determining broader economic outcomes. This approach, termed a "hierarchy of institutions" by Acemoglu et al. (2005) and further advanced in Acemoglu and Johnson (2005), argues that the distribution of political power affects the creation of property rights and rule of law, which, in turn, have been shown to mediate economic results (a finding echoed by Flachaire et al., 2014). Acemoglu et al. (2005) further formalize this hierarchy into a model of institutional influence, arguing that the distribution of resources and the distribution of power (likely, but not necessarily, linked) have the predominant effect on a country's growth path precisely through their effect on economic institutions such as property rights.

There are numerous examples of how this hierarchy works in practice, showing where political institutions influence economic outcomes. In particular, money, as a unit of value or a method of exchange, has been subjected to political manipulation for centuries, leading to the development of an entire economics literature related to issues of "dynamic inconsistency"

(Kydland and Prescott, 1977); most prominently, the literature on central bank independence (CBI, as shown in Cukierman et al. (1992) and continued by many papers since) has attempted to show how proper institutional arrangements could, in certain circumstances, mitigate political incentives for monetary manipulation.

However, the wrinkle in this vast literature is that while it reveals the channels in which political institutions may influence economic institutions, it does not necessarily consider that the relationship can run in both directions over a short time frame. Within the hierarchy, there is an acknowledgement that economic institutions may influence political ones in the *long* term, as a country's distribution of power may be changed by shifts in "the relative bargaining power of rulers versus constituents (or rulers versus rulers) … [or] major, persistent changes in relative prices" (North, 1984:260). Acemoglu et al. (2005, among others) find that political institutions are slow-moving and difficult to change, as "political institutions as a means of allocating political power… regulate the *future* allocation of political power" (Acemoglu and Robinson, 2005:24). But while this reality is plausible in times of normal political processes and in the absence of external threats, this assertion can be challenged during severe economic disruptions. Extreme behaviour by economic institutions, either during or in precipitating a crisis, may, in turn, disrupt or determine political institutions and their subsequent paths, quickly altering the status quo in a destabilizing manner. Crisis periods, episodes of hyperinflation, and invasion all have the ability to force changes in power distributions across society and thus alter political institutions as well. Even more "normal" economic disruptions may change bargaining strategies and political coalitions, leaving a country's political institutions transformed.

The reborn Second Polish Republic, existing from 1918 to 1939, appears to be a key example of the influence of economic institutions on political institutional formation. Unlike modern theories of monetary policy, which focus on the need for independence from political pressure, the experience of Poland seems to show instead that monetary institutions had a direct and deleterious impact on nascent political ones. Many researchers have argued a similar thesis regarding Poland's large western neighbour during the interwar period—namely, that hyperinflation weakened the Weimar Republic (Hill et al., 1977) and led to the rise of the Nazis, who promised economic stability (van Riel and Schram, 1993). But despite the attention that Germany has received in the historical, political science, and economics literature, little attention has gone to Poland, which also saw both high inflation and a rapid decline in the rule of law.

In the Polish case, the hyperinflation of the early 1920s, in particular, and the seeming political impotence in fighting it, led to a more authoritarian-minded government coming to power in 1926. This government, the *Sanacja* (sanitizing) regime, progressively eroded the rule of law until Poland became a proto-fascist state on the eve of its dual invasion by Germany and Soviet Russia. And throughout the interwar period, Poland uniformly saw episodes of the degradation of the rule of law preceded by massive bouts of monetary instability.

The purpose of this paper is thus to revisit the "hierarchy of institutions" debate, tracing the effect of monetary policy in Poland in the interwar period. Assembling a new dataset of historical data on a monthly basis, tracing the development of macroeconomic and institutional aggregates in Poland and the rest of Central Europe, and using a new measure of rule of law, this paper attempts to formally model the relationship between monetary policy and rule of law econometrically. Extending the literature on institutional endogeneity, the key result of the paper is that there is a consistent, small, but highly significant effect of monetary policy on the rule of law in the Second Republic. This result is robust to various specifications, endogeneity, and different proxies of profligate monetary policy, and holds even after accounting for a large number of covariates, which could plausibly be related to the development of a rules-based political system. While political attributes are still important for the development of Poland's political institutions, across the board, economic conditions and institutions appear to have had a much larger effect.

2. Monetary policy and the rule of law: the link

As the quote attributed to Lenin (White and Schuler, 2009) at the beginning of this paper makes clear, the relationship of money to the functioning of political and other economic institutions is not a new idea; in fact, it has appeared throughout the past two centuries in various works on political economy. However, much of the theoretical and empirical research in modern economics literature has inverted this research question, focusing instead on the effect that rule of law or overall institutional quality has on monetary policy or the design of monetary policy institutions (Mishkin, 1999; Fatás and Mihov, 2013). Driven by attempts to isolate the determinants of short-term macroeconomic outcomes (growth or inflation), this literature has tended to assume that a country's level of rule of law is exogenously given rather than endogenously determined over short time frames (for a recent example, see Calderón et al., 2016, who examine institutions and macroeconomic policies from 1984–2008). The empirical results from these studies show that monetary institutions and their outcomes depend upon the rule of law to function properly (e.g. Eijffinger and Stadhouders, 2003). Much of the literature on central bank independence is formed around the assumption that monetary policy institutions are a derivation of political institutions (even if it is not explicitly stated), and thus central banks need to be insulated from political pressure via independence, whether legal or operational.

Left unspoken in the prevailing literature is how these monetary policy institutions, and the policies they then pursue, would translate into political institutional changes. It is highly likely, if not certain, that monetary policy at time t does not only affect other macroeconomic aggregates at times t through $t+n$ but would also influence political institutional development during this same time frame and beyond. For example, over the long term, monetary policy can have a direct and profound effect on the distribution of power in a country (Woolley, 1985; Argitis and Pitelis, 2001), which then filters through to that country's political structures. This influence is especially relevant under the assumption of central bank independence, where the economic institution of the central bank is theorized to be explicitly insulated from the political institutions of the government. If, instead, causality runs in the other direction, the effects from an independent monetary authority's actions, unconstrained by political considerations, could be quite large

on the political institutions it resides among. Monetary policies do not need to have such a direct effect, however, as poor monetary policy may also send important signals about the prevailing institutional structure and its inability to function. Such a prolonged mismanagement of the currency could have sudden and unpredictable effects, leading to (sometimes radical) institutional change.

Even over a short period of time, the exogeneity of political institutions cannot be plausibly assumed, as changing macroeconomic conditions create different electoral strategies, different political coalitions, and different political approaches to economic policy. In times of severe economic distress, as during the Great Depression or more recently during the Global Financial Crisis, governments may aggregate powers to themselves that were previously unheard of during times of economic growth. This aggregation of economic powers may also lead to an expansion of political powers as well, altering the path of both political institutions (rule of law) and monetary policy for the future. As Andrews and Montinola (2004) note, the reduction of veto players in an economic system makes for specific policy paths, especially in the monetary realm, so that previous monetary policies, by influencing the political system, could set the course for future monetary policy.

Despite this theoretical basis, the relationship of monetary policy on political development has thus far been explored mainly in political science, sociology, and heterodox schools of economics. Both Neo-Mengerian (Austrian) and post-Keynesian approaches, reasoning from nearly the same analytical basis, note that money is an endogenous construct within a system, and as such is also a political institution unto itself. While the two heterodox schools diverge in their prescriptions on how monetary authorities *should* act, both schools of thought identify the institutional structure of central banking and its modern practice as threats to rule of law (see Canova, 2009 for the post-Keynesian argument and White, 2010 for the Austrian one).[1] From a post-Keynesian perspective, the conduct of monetary policy without explicit oversight from political institutions creates imbalance in the political system and allows one political authority, the one controlling the money supply, to impose its own desires upon the political system and bypass democratic legitimacy (Arestis and Bain, 1995). In this manner, the rule of law is replaced by a financial elite. On the other side, Austrians argue that the use of money for policy objectives means concentrating discretion in the hands of a few and allows for arbitrary transfers among segments of the population. As Hanke (2003):133) notes, the use of policy to advantage or disadvantage segments of the population means that property rights are never truly protected, and thus "governments that fail to protect the value of their money are guilty of not abiding by the rule of law."

Despite the long history of theorizing the relationship between monetary policy and rule of law, only recently has there been a more mainstream attempt to develop a theory (with corresponding empirics) regarding the influence of monetary policy on a country's institutional make-up. One of the early mainstream papers to touch upon this idea was Hoff and Stiglitz (2004), who noted that *tight* monetary policy could affect the rule of law; using the example of Russia in the 1990s, they asserted that any policy that decreases credit availability hampers long-term time horizons and thus the rule of law.

Much more comprehensive than this early paper is a recent work from Koyama and Johnson (2015), who argue that *loose* monetary policy is far more destructive to country-level institutions. Drawing on a panel dataset of 143 countries but over a short and recent timespan (from 1996 to 2011), Koyama and Johnson find a strong negative relationship between rule of law and inflation, concluding that monetary instability does in fact erode the rule of law. They speculate that there are two separate avenues through which monetary profligacy could have this effect:

1. *Monetary instability favors specific segments of society (debtors) over others (savers), creating incentives for non-market activities.* This political decision on who wins and who loses in society would naturally create groups with a vested interest in seeing such policies continued. Under such an eventuality, politicians would be willing to work to the advantage of these groups and keep such policies in place (advantaging short-term gains over long-term sustainability). The longer-term effect of such policies would also be, as Koyama and Johnson (2015) note, to reduce the political power of the middle class, further stratifying society and impacting institutional development.

2. *Monetary crises create their own terrible solutions.* Monetary crises, begun as a politically-motivated decision to manipulate economic aggregates, tend to encourage interventionism, aggregation of powers to the executive, and additional measures which transfer power from the market to the government; Koyama and Johnson (2015) mention price and wage controls, as well as noting that the panic which sustained monetary profligacy can engender could lead to the creation of a number of measures that would never be accepted in normal economic times. As President Obama's former Chief of Staff Rahm Emanuel said, "you never let a good crisis go to waste."[2] The issue for rule of law is that this is precisely what would come to pass.

In addition to these potential channels of influence, a third one must be noted, especially relevant for countries in a state of flux. In newly-independent or transition economies, the entire institutional environment is evolving simultaneously, as the lack of institutional memory means that the economic system is continuously adjusting to new information, new actors, and, oftentimes, new patterns of production and trade. In this environment, it is crucial for institutions to receive the appropriate signals for their evolution, as the path-dependency of institutional change means that a new path can be moved towards quite easily; as Koppl (2006:235) notes, "institutions generally work best when they are governed by relatively simple rules rather than discretion," and such discretion can cause chaos at the initial stages of institutional genesis. With monetary institutions overwhelming the price mechanism and encouraging non-market activities, the institutions that will be created in this environment will not be those that facilitate a market

---

[1] The divergence in prescriptions is pronounced, as Neo-Mengerians prefer to eliminate the central bank and move towards free banking, while post-Keynesians wish to eliminate the independence of the central bank and bring its mandate in line with broader economic policy goals and interventions.

[2] Spoken at the Wall Street Journal CEO Council in Washington, DC, on November 9, 2008. Video of his talk, including this quote, can be found at: https://www.youtube.com/watch?v=_mzcbXi1Tkk.

economy, but rather those that are created in an atmosphere of distortions. This applies not only to economic institutions but also to political ones, especially in a situation where the new political authorities have no experience in dealing with the needs of a free market. In an atmosphere of monetary profligacy, it is highly likely that the rule of law, based as it is on predictability and impartiality, would be affected.

This combination of mixed signals and institutional evolution can be exacerbated by the political institutions themselves, especially when democracy, allowing for free and open elections, is evolving alongside nascent economic institutions. Under a democratic regime, voters have the ability to correct for poor economic policy, whether perceived or real, and can act through the ballot box to correct past monetary profligacy. However, the manner in which society acts may not necessarily be in the best interest of institutional development for the longer term, especially in regard to economic institutions.[3]

This reality may be illustrated with a simple median voter model.[4] In the first instance, it is helpful to assume that the income distribution of the economy mediates the response of society to inflationary outcomes; this is not a new observation, as noted above, as savers and laborers (generally poorer) should be inflation averse (inflation acting as a tax on their wages and savings, especially if they were not indexed), but politicians, borrowers, and holders of assets like land (i.e. those likely to be wealthier, see Robinson, 1979) might favour looser monetary policies. Inflation outcomes would then be determined by the relative size of each group: in an economy that is more agrarian, or where the inflation averse outnumber the inflation seeking, the median voter is likely to also be more inflation averse. Or, as Przeworski and Limongi (1993:53) note in the context of incomes, "if the median voter is decisive and if the market-generated distribution of income is skewed downward, as it always is, the majority equilibrium (if one exists) will call for a greater equality."

In such a situation, where inflation-averse voters are relatively abundant, there is no guarantee that inflation will not occur, as politicians still follow their own incentives (the famous dynamic inconsistency problem of Kydland and Prescott, 1977). However, when inflation, especially at very high levels, does occur, the median voter would likely vote for the party which promised stability, as it would stop the taxation of the poorer segments of society. In an atmosphere where the party system was not developed or was, itself, chaotic, the median voter might then gravitate towards strong personalities that could deliver this stability. Unfortunately, in an environment in flux, leaders brought in under such circumstances would likely not limit themselves to monetary stability, but to broader worries about economic and political instability in the country. The ramifications of this assumption regarding stability would be a greater concentration of power in the executive as a way to both project confidence to the voters and to control potential sources of instability in the country. Both of these trends would, in the longer term, lead to an erosion of rule of law.

3. Monetary policy and political change in interwar Poland[5]

This was precisely the case with the new Second Republic of Poland. Having disappeared from the map of Europe via the Partitions and having been governed by three differing approaches to economic policy over 123 years (corresponding to its three occupying empires—Prussia/Germany, Russia, and Austria-Hungary), Poland was without hands-on knowledge of basic modern economic institutions in 1918.

Paramount among these institutions was a central bank, an institution that was of no importance in Warsaw when monetary policy was controlled in Berlin, St. Petersburg, and Vienna. Perhaps fortuitously, however, German occupiers had established the "Polish National Credit Bank" (*Polska Krajowa Kasa Pożyczkowa*, or PKKP) in December 1916 on the Polish territory, giving it a mandate to issue local currency (the Polish Mark) at parity with German Marks. Following independence, the interim government ordered the PKKP to continue as the bank of sole issuance; however, the challenge of building a modern monetary authority, already difficult in a post-conflict setting and with little administrative capacity,[6] was compounded by the fact that at least five separate currencies were operating on Polish soil (Wolf, 2005).[7] With the Polish Mark the only currency that the government in Warsaw could control, it was slowly introduced as a parallel currency wherever it was not already in circulation. Concurrently, the four other currencies used across the Republic were gradually withdrawn by the central authorities, a process that was completed by early 1920 (Landau, 1990).

Unfortunately, this success was short-lived, as the Second Republic faced continuous conflict in the early 1920s, beginning with a brief war with Ukraine in 1919 which then developed into a prolonged conflict with the Soviet Union. The Russo-Polish war also created massive fiscal problems, and, in order to finance the conflict, the new Polish government followed the experience of other countries in the region and resorted to profligate monetary policy to finance its spending. This led to predictable consequences: as Wolf (2005:417), quoting Zdziechowski (1925), notes, "the money supply increased between 1918 and 1919 by 519%, in the following year by another 929%, to reach in 1923 more than 12,000,000% (!) of the level in 1918."

Even after the Treaty of Riga ended the war in March 1921, the government continued to use seignorage to finance new spending (Sargent, 1982). From 1921 and 1922, the number of notes in circulation increased by 316% (in 1921) and a further 231% in

---

[3] Hartwell (2013) makes this point in transition, as data shows that stronger legislatures early in the transition process slowed the growth of economic institutions, mainly due to a proclivity to redistribute income which then stifled incentives for market operators.

[4] Thanks to Harald Uhlig for suggesting this framework.

[5] The historical retelling of this section is based on Hartwell (2016).

[6] This problem was exacerbated by the interim Polish government, who, upon independence, decided immediately to replace all German staff of the central monetary authority with Poles.

[7] As Wolf (2005) notes, these currencies were, in addition to the Polish Mark, the German Mark, the Austrian Crown, the Russian Ruble, and the "Ost-Rubel" on the territory of "Ober Ost," which included Lithuania and Białystok-Grodno.

1922, leading to an increase of over 100% in the wholesale price index in just four months in 1922 (July to October). Creating a constituency in the growing industrial sector, which saw an implicit state subsidy in the form of continually falling export prices (Landau and Tomaszewski, 1984), the wholesale price index ballooned to an unlikely 248,426.60 (with 1914 as the base) from a manageable 32.88 in March 1920 (based on Sargent, 1982).

The hyperinflation was only broken with the creation of a new currency and a new central bank. The złoty was introduced as legal tender in 1924, backed by a reserve of gold and major foreign currencies (Sargent, 1982). The new institution to oversee this currency, Bank Polski, was modelled on the Bank of England and, foreshadowing the debates on central bank independence fifty years later, was set up as a joint stock company in order to retain some autonomy from the Polish government in setting monetary policy (Landau and Tomaszewski, 1984).

Prices began to stabilize immediately as the amount of money in circulation dropped dramatically, with money supplies levelling off by January 1925. But even with hyperinflation defeated, inflation remained very high in the following five years (approximately 16% annually) and employment levels struggled to recover, as firms which had benefited from the inflationary subsidy went bankrupt following stabilization. Similarly, the nascent Polish banking sector underwent a massive crisis in 1925 once the monetary stimulus of the previous years ended (Morawski, 2008), a situation exacerbated by the easy money regime, which created banks with low levels of capital reserves, excessive staff and administration, and inflated costs of administration (Taylor, 1926).

Exhausted by years of subpar governance and economic results, Polish Marshal Josef Piłsudski, a hero of the Russo-Polish war and Chief of State from 1918 to 1922, led a coup that overthrew the elected government in 1926.[8] The new regime, named "*Sanacja*" (literally "sanitation," signifying a cleansing of the body politic), was meant to curb the weakness of the previous revolving-door governments by centralizing power in the office of the executive and curtailing the *Sejm* (Polish parliament).[9] The new regime also codified its newfound authority in a new Constitution in August 1926, giving the President the right to dissolve the *Sejm* and to pass resolutions with the force of legislation (Kowalski, 2014).

With the new "Sanitation" regime in place, one of the moves undertaken by the government to ensure economic stability was a switch to a full gold standard in late 1927. While Wolf (2007:359) notes that "Polish monetary policy apparently hinged to a large degree on the strategic considerations of the regime," the dependence of the regime on foreign investment also meant that monetary stability equaled investment, which equaled political stability. In this sense, the hardening of the currency was a way for the unconstrained executive to wrest back monetary stability so that it would no longer threaten the regime.[10] However, the effects of monetary instability in the early 1920s continued to linger, as the price level in Poland in 1935 was only slightly below that of 1929, meaning that the excess liquidity and artificial price inflation that had been injected into the system by the hyperinflation still had not been wrung out by the new monetary regime.

More importantly, the possible long-term benefits of disinflation for Poland (including perhaps for the rule of law) had little chance to accrue, as Poland left the gold standard in April 1936. This monetary decision was exogenously conditioned by the coming end of the "gold bloc," but was also spurred on by the desire to undertake massive fiscal stimulus (mainly military spending) in a tight fiscal environment (Wolf, 2008).[11] Indeed, in pursuit of this fiscal goal, upon leaving the bloc, the Polish government began (slowly at first but in a much more accelerated manner in 1938) to re-inflate the *złoty*, quickly abandoning the rectitude that characterized the gold standard years. Concurrently, the regime expanded its powers even further: in the economic sphere, the regime instituted exchange and capital controls in 1936, with additional and more stringent ones introduced throughout 1937 and 1938, while in the political sphere, a new, proto-fascist Constitution was introduced one year prior to Poland exiting the gold standard in April 1935.[12] With the death of Piłsudski in May 1935, and without the force of his personality, political instability returned as his successors wasted energy on maneuvers to assume the presidency (Haczyński, 1975). But regardless of who was in power, the damage to the institution of rule of law in Poland had already been done.

4. Data and estimation

4.1. Data and identification strategy

In order to test econometrically the relationship between rule of law and monetary policy in interwar Poland, I have compiled a new monthly dataset of economic conditions in the Polish Republic from December 1918 to August 1939. As in all economic history, the paucity of historical data makes econometric estimation susceptible to omitted, underlying variables driving the results. However,

---

[8] The designation "chief of state" (*Naczelnik Państwa*) was used only for Piłsudski, as the powers of this post were transitioned to the President upon the end of Piłsudski's term in December 1922.

[9] In fact, the *Sejm* sanctioned this transfer of powers, offering Piłsudski the office of President after the coup, an offer he declined in favor of his protégé, Ignacy Mościcki (Lerski 1996).

[10] The monetary reforms in 1924 were a first attempt at imposing stability, as the stabilization package tied the złoty to the Swiss franc (which itself was backed by gold), as well as other foreign currencies. But while there was a proxy gold standard in place as a result of this reform, monetary discretion still prevailed for another three years.

[11] Great Britain left the gold standard in 1931 and the US in 1933, Italy in 1934, and Belgium in 1935. France, the Netherlands, and Switzerland remained until the end, exiting the gold bloc in early October 1936.

[12] While the 1935 Constitution did not explicitly create a fascist state, it eliminated all checks and balances on the executive, brought the judiciary under the control of the executive, extended the term of the President to seven years (with no term limits), and, most notably, in Article 7 noted that "the state was to be an organizer of public life."
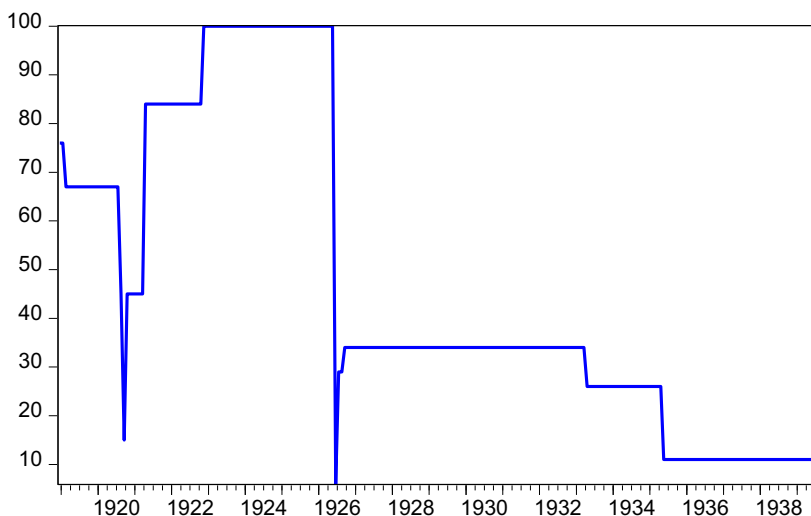
Fig. 1. The MaxRange regime value in interwar Poland.

while the scarcity of high-frequency data from the inter-war period is problematic, enough data was available across disparate sources (many never before compiled in a database) to allow for the development of an identification strategy in examining our thesis. In particular, macroeconomic and monetary data were assembled from the League of Nations *Monthly Statistical Bulletin*, the Global Financial Database, the German *Statistiches Jahrbuch* from various years, and Polish sources, while political data and estimations of the rule of law are derived from both existing and brand-new datasets or were created based on the political history of Poland (see Data Appendix).

As the proxy for rule of law, I utilize a new indicator for access to the political system, that of "regime value" taken from the "MaxRange" dataset. Compiled by researchers at Halmstad University in Sweden and covering political institutions and regime types on a monthly basis from 1789 to the present day (Rånge and Sandberg, 2017), this dataset offers a new way to conceptualize the extent of democratic access to the political system. The regime value measure used here allows for fine gradations in the type of political institutions that exist in a country; coded from 0 to 100, with higher numbers representing more democratic access, the regime value variable encapsulates the checks and balances within a system, particular institutional arrangements, and political competition (the complete coding and corresponding regime type is shown in Appendix A).

The composite index for "regime value" contains within it four sub-variables, including regime type, accountability structure, executive strength, and whether a regime is "normal" or "interim." These sub-variables are then further delineated into indexes; for example, as noted in Rånge and Sandberg (2017:506–507), there are seven specific main components of the "regime type" indicator:

1. *Territorial control*: if a government has functional control over the vast majority (defined here as of at least 67%) of a country's territory;
2. *Political competition*: the existence of at least two "serious and competing political alternatives in national elections;"
3. *Freedom of speech, media, and assembly*;
4. *Electoral integrity and quality*: "Candidates must not be subject to intimidation, repression, or major obstruction. In addition, voters are entitled to secrecy and the absence of systematic electoral fraud;"
5. *Constitutional consensus/legitimacy*: presence of an established constitution which preserves minority protections but also the acknowledgement by the minority of the majority's right to rule (in practice);
6. *General suffrage:* widespread right to vote; and
7. *Constitutional order:* executives "must not violate an established constitutional order, such as the separation of executive, legislative, and judiciary authorities. Furthermore, a government or executive cannot make decisions without a proper constitutional amendment or parliamentary approval."

Similarly, executive strength can be thought of as a continuum of seven classifications, including absolute, overwhelming, dominating, significant, constitutional, weak, undefined, and martial law.

The overall regime value indicator is calculated by first weighting each of the classifications within each sub-variable and collating the total (i.e. adding up the scores for regime type under the order of importance as shown above), and then adding the four sub-variables together (also weighted by order of importance, i.e. with regime type and accountability having the highest weight).

The broad-based nature of this variable, with its emphasis on several different facets of democratic accountability, makes it an excellent proxy for the political institutions of interwar Poland and, in particular, the rule of law. Moreover, the indicator shows substantial variation across the over 20 years' worth of monthly data in Poland assembled here; as Fig. 1 shows, Poland lurched from an intermediate elected interim government to a qualified democracy (the highest score possible) and then fell to absolute governance before rebounding to a military parliamentary system and finally a hierarchical military-dominated parliamentary system. These
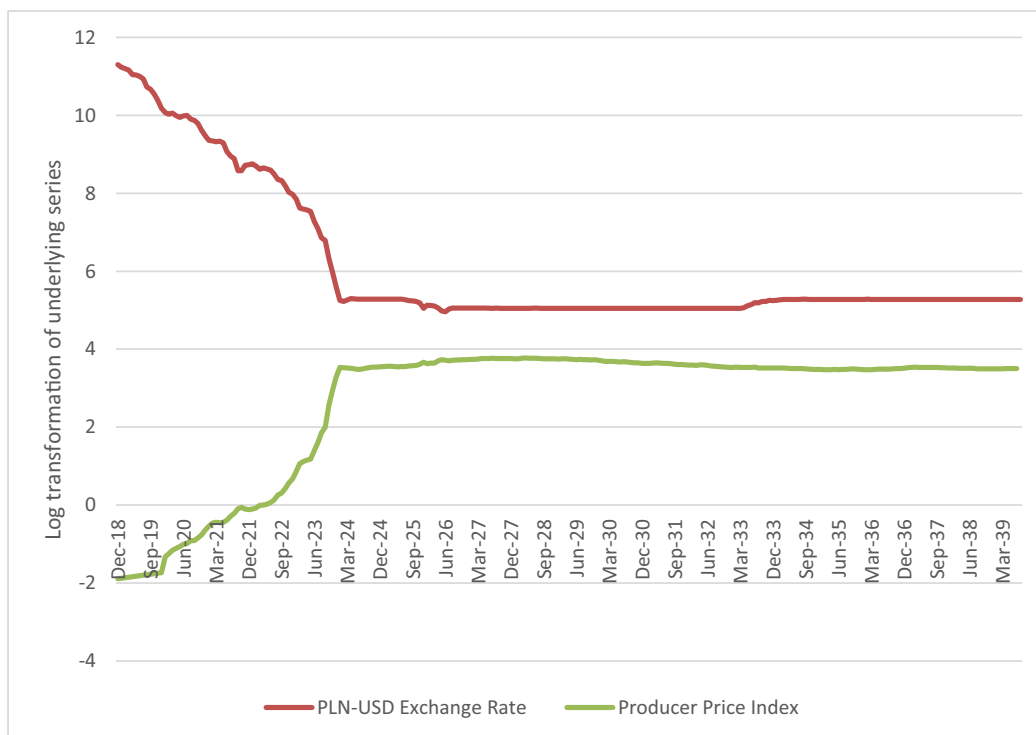
Fig. 2. Log of monetary policy indicators, 1919 to 1939.

changes, even though they may be slow-moving and discrete (which will be corrected for in the choice of estimator, shown below), offer an opportunity to test our hypothesis econometrically.

For the key independent variable of interest, monetary policy, several variables are used as proxies for monetary (in)stability in the interwar period. In particular, the empirical examination below will utilize the Producer Price Index (PPI) as the main proxy for monetary policy to capture pass-through inflation at the wholesale level before it reaches consumers. Additionally, as a control, I will use the USD/złoty (or mark) exchange rate, which may be impacted by poor monetary policy even more quickly than producer prices. Finally, as an additional control, a dichotomous variable for monetary policy similar to that of Bernanke and Mihov (1998) and Conover et al. (1999) will be used, taking the value of 1 if monetary policy was tightened in the past month and 0 if it was not. The underlying series to determine this monetary policy stance in interwar Poland is the stock of currency in circulation, a variable which was utilized as the key monetary policy instrument by both the PKKP from 1918 to 1924 and Bank Polski from 1924 onward.[13] Given the reality that monetary policy was not necessarily a month-to-month strategy (although some evidence of interwar Poland says that this indeed was the case), I also use a quarterly dummy for monetary tightening, with a month being coded as 1 if the previous three months showed a decline in the amount of currency in circulation.[14]

These variables have several salutary aspects, not least that they have an unbroken series spanning the entire interwar period (the exchange rate was originally missing some months immediately following the currency reform in 1924 but was obtained by hand, see Data Appendix). As von Thadden (1995) also notes, each of these indicators tended to track the other, especially in the early years of the Second Republic, and plotting out the entire series of the PPI and exchange rate variables shows that this is indeed the case (Fig. 2, with indicators log-transformed to reduce vast discrepancies in scale). But while the hyperinflation tends to make all changes in the post-1924 period appear minor, the period after the currency reform in 1924 was anything but mild, as Fig. 3 shows.

---

[13] Monetary emissions are explicitly referred to in the Bank's operating statute in reference to the zloty's relationship to gold prices and reserve requirements of the Bank. See *Statut Banku Polskiego (jako załącznik do rozporządzenia prezydenta z 20 stycznia 1924 r)* [Statute of the Bank of Poland (an annex to the Presidential Decree of 20 January 1924). An interesting insight and critical analysis of this facet of the Bank Polski (among many others) is given in Buczkowski (1927).

[14] An anonymous referee suggested that perhaps interest rates could also be used as an indicator of monetary policy, but this is unfortunately not the case in interwar Poland. In the first instance, the PKKP and later Bank Polski conducted monetary policy by targeting the money supply, not by using the interest rate. Secondly, as a relatively small open economy, especially during the gold standard years, Poland was an interest rate-taker and not an interest rate-maker, subjected to global interest rate fluctuations. Finally, while spreads on interest rates may be indicative of monetary policy issues, such a blunt approach would more likely encompass political risk in Poland as well; that is, interest rate spreads would be another proxy for the left-hand variable (changes in rule of law) rather than the right-hand variable of interest (monetary policy). For these reasons, other indicators as noted above were utilized.
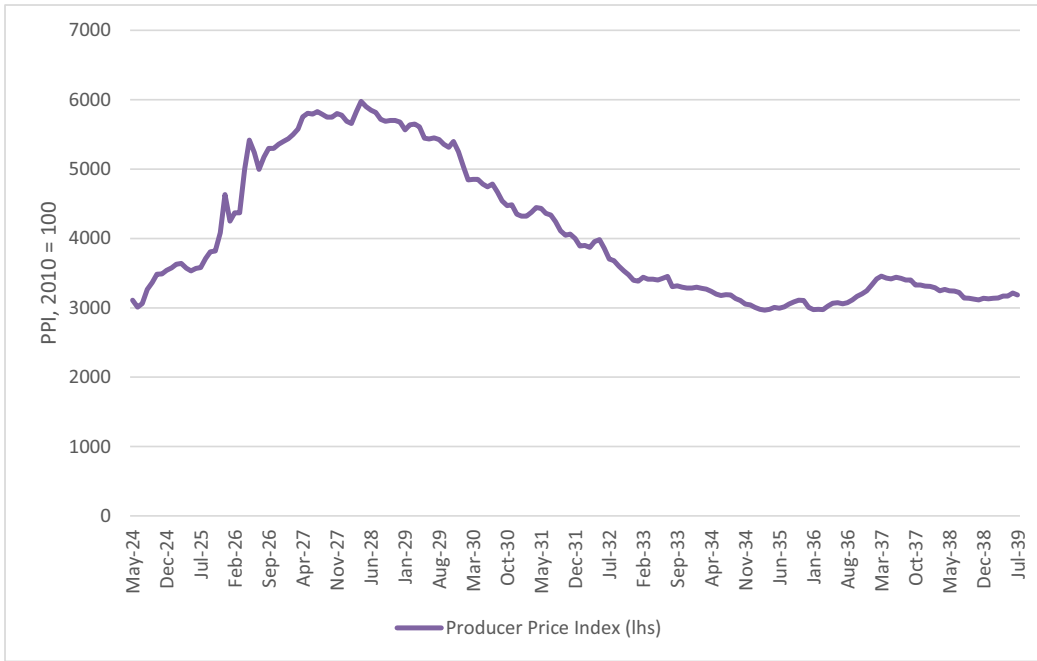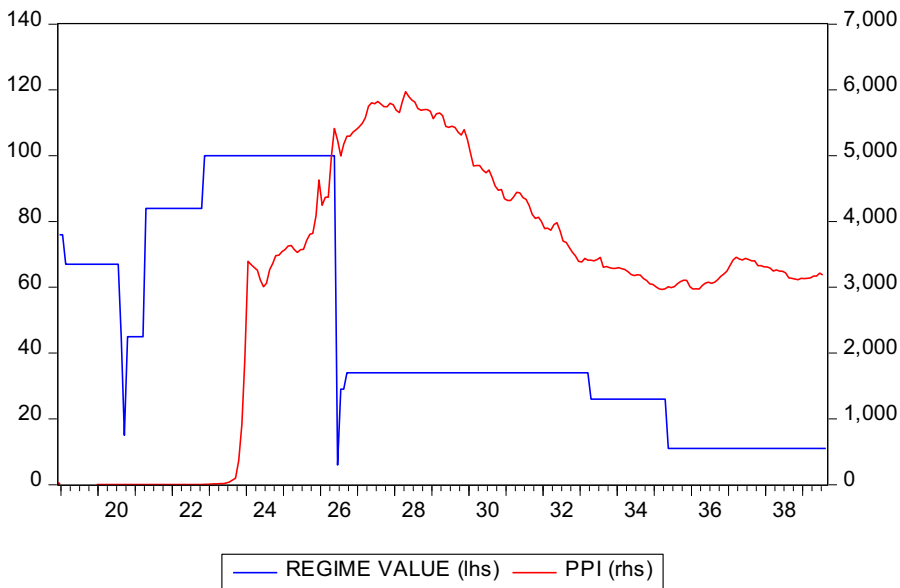
Fig. 3. PPI in Poland, 1924–1939.

Fig. 4. Regime value and producer price indices in Poland.

Moreover, taking a quick look at the data (Figs. 4–7), it appears that there is a strong correlation between changes in these monetary variables and the regime value.

Given the apparent correlation between monetary policy and rule of law in interwar Poland, the next stage is to formally model the relationship. A sign-restricted vector autoregression (VAR) similar to that of Uhlig (2005) is often utilized to model the effects of changes in monetary policy on various outcome variables. This approach derives the impact of (sign-restricted) shocks with as little use of theorizing as possible in reference to the variable of interest.

However, a VAR framework is not appropriate for use in this examination due precisely to this atheoretical nature. In the literature, VARs are used almost exclusively with macroeconomic outcomes, where information about future responses of macroeconomic variables to a policy shock may be gleaned from information embodied in lags of these variables (and how the variables have related
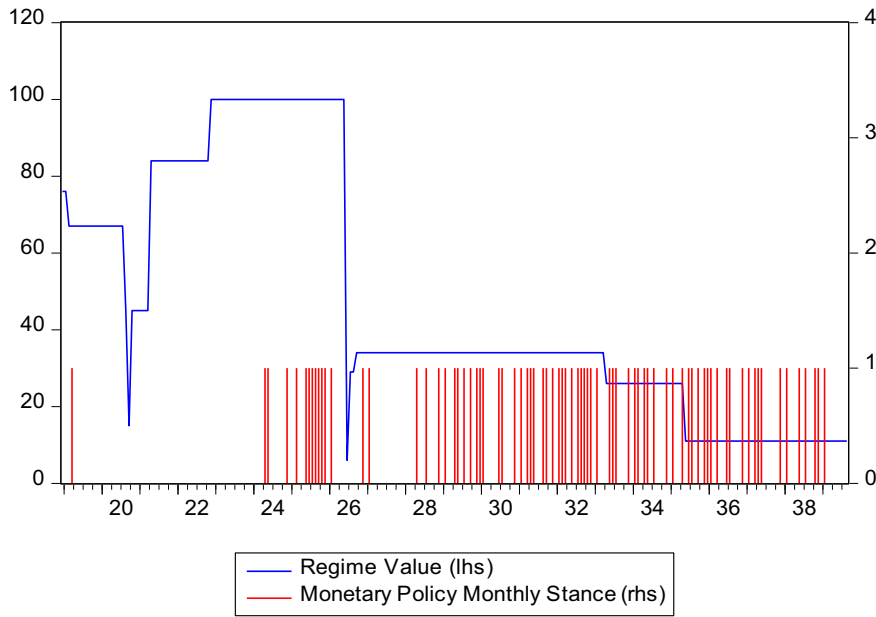
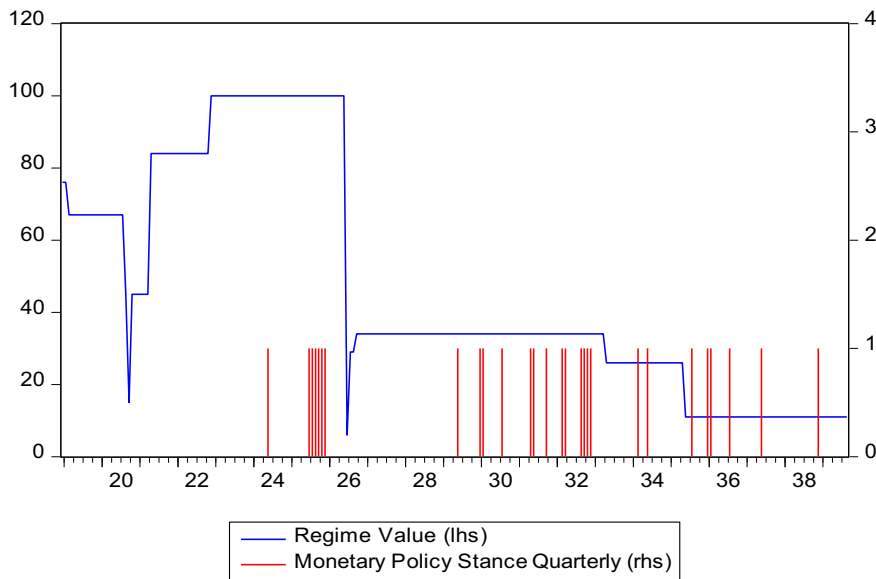**Fig. 5.** Regime value and monetary policy stance (monthly).

Fig. 6. Regime value and monetary policy stance (quarterly).

to each other in the past). While papers may use institutional shocks on the right-hand side (see, for example, Góes (2016), who uses institutional shocks to trace out changes in GDP, or Wells and Wills (2000), who examine the effect of political changes on stock prices in 17th century England), there exists, to my knowledge, no such papers that use an institutional variable as the *Y* variable in a VAR setting with macroeconomic and other institutional proxies as *X* variables.[15] This omission from the economics literature is likely because institutional changes are *not* simply a function of prior institutions and exclusively macroeconomic policies, and thus are not captured well in a VAR. In particular, in an environment of institutional change, the relationship between a policy shock and

---

[15] Exceptions to this come from the political science literature, but there is tendency to use solely institutions and policies within a VAR framework rather than mixing macroeconomic variables and institutional indicators. See, for example, Krause (1996), who examines the effects of various institutions of the US government on each other in a dynamic administrative model. Krause's VAR models each institution's behavior as a function of other institutions and its own past information; beyond restricting the analysis to the effects of institutions on each other, his model also notably focuses on a highly stable institutional system, something that cannot be said about Poland in the interwar period.
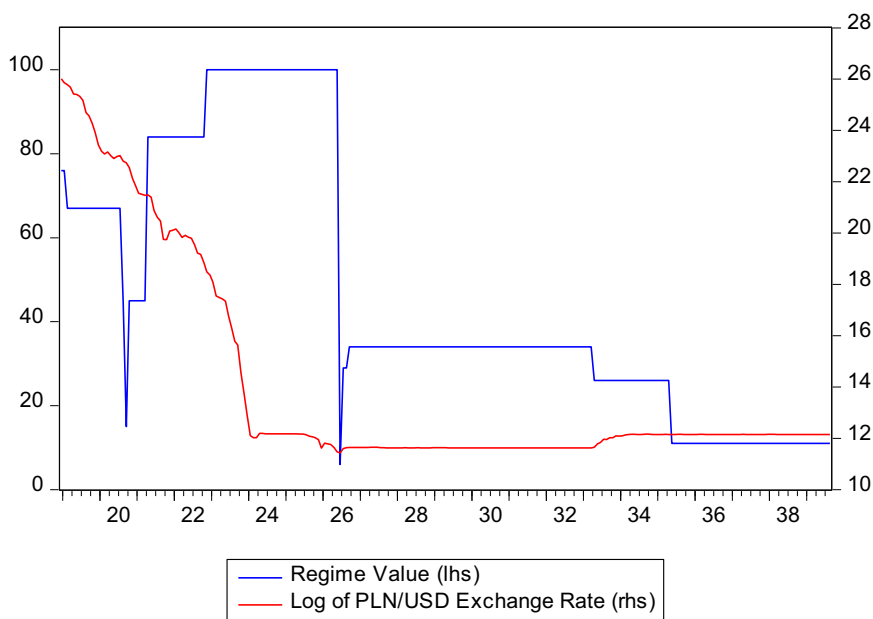
Fig. 7. Regime value and PLN/USD exchange rates.

that particular institution will not only be a function of prior responses, as an institutional response may (and indeed, should) differ due to the current form and composition of the institution.

This reality is amplified in an institutional setting where many institutions are in flux, such as in a country returning to independence for the first time in 123 years; in such an environment, prior relationships among economic, political, and institutional variables may no longer hold, nor may they provide pertinent information for the future understanding of shocks. A theory of institutional change and the feedback between institutions and macroeconomic variables would then be necessary to understand their relationship, allowing us to "separate endogenous and exogenous components of variance in policy variables by careful historical analysis" (Sims, 1980:12). The lack of such a theory in a VAR, and its reliance on past relationships, makes understanding the effects of macroeconomic policies on institutions incredibly difficult both economically and econometrically.[16]

Rather than use an agnostic VAR approach, but instead building off of both the previous literature and recent advances in time-series modeling, the identification strategy used here follows in the spirit of Tabellini (2010), fashioning a theory on the broader economic determinants of the rule of law, encompassing as many plausible covariates as possible which fit the theory. Such a model would take the econometric form of:

$$\ln\left(RegimeValue_t\right) = \alpha MonetaryPolicy_{t-1} + \beta X_{t-1} + \varepsilon_t \tag{3}$$

Where Y is the MaxRange regime value variable, *Monetary Policy* is one of the three proxies noted above, lagged one month, and *X'* represents the comprehensive vector of controls which could also plausibly be connected with the generation (or destruction) of rule of law.

Unfortunately, there exists only a very small economics literature examining the theoretical determinants of rule of law which could fill vector *X* in Eq. (2). A rich literature exists across disciplines on the possible determinants of *democracy*, including Muller (1995), Barro (1999), Berkowitz et al. (2003), Acemoglu and Robinson (2005), Csordás and Ludwig (2011), and Møller and Skaaning (2014). These papers focus on the role of economic development, legitimacy, and general regional and global trends in political institutions. While not explicitly linked with rule of law *per se,* some of the variables found to associate with democracy could also plausibly have some overlap with democratic access and predictable decision-making. Unfortunately, many of the most popular correlates with democracy, as summarized in Møller and Skaaning (2014), are not appropriate for examining the source of rule of law in interwar Poland. Variables such as country size or dominant religion were time-invariant over this period, while data such as urbanization suffer from too few data points (on an annual basis) combined with slow-moving attributes.[17] A commonly-used explanator for rule

---

[16] Finally, attempts to model the effects of monetary policy on institutional change in Poland yielded no significant results for *any* variables in the system, showing that the VAR had little explanatory effect for capturing relationships within interwar Poland (Appendix C contains the results of this examination).

[17] The working version of this paper used an interpolated series of urbanization which registered as highly significant in determining the rule of law. However, upon closer examination, the statistical properties of this series (an imposed unit root) and the tight bounding of it over this period (Poland's urbanization rose from an estimated 23.8% of the population to either 28 or 30%, depending on the source) made the results somewhat suspect.

Table 1

Data descriptions.

Variable	Description
Rule of Law Variables	
Regime value	Variable capturing the constitutional process, access to democracy, and political competition within a country, taken from the MaxRange dataset. The variable is coded from 0–100, with higher numbers signifying more rule of law-based political systems.
Executive constraints	The amount of constraints that the executive of a country faces, coded from 1 to 7, with higher number corresponding to more constraints.
Fascism transition	Dummy coded as 1 in the month a fascist transition occurred in one of Poland's neighbouring countries, 0 otherwise.
Fascism momentum	Categorical variable showing the cumulative number of fascist neighbours Poland had by month.
Average Polity	The monthly average of the Polity IV score of Poland's nine closest neighbours: Austria, Czechoslovakia, Estonia, Germany, Hungary, Latvia, Lithuania, Romania, and the Soviet Union.
War	A dummy variable taking the value of 1 in the month that Poland was involved in an armed conflict and 0 otherwise.
Currency and controls	
Producer Price Index	Survey of wholesale prices across Poland, denominated in złoty. *Re*-indexed by GUS at 2010 = 100 to create a long historical series.
Polish currency to USD exchange rate	The average monthly exchange rate of the official Polish currency in circulation (Mark to 1924, złoty thereafter).
Monetary policy stance	Two separate variables utilized here: first, a month was coded as 1 if the currency in circulation in that month was less than the previous month, 0 if otherwise. For the second variable, the monetary policy stance over the quarter was examined, with a month coded as 1 if currency in circulation declined for at least three consecutive months, 0 if otherwise.
Regime dummy	A dummy taking the value of 0 from December 1918 to April 1924 and 1 afterwards; this captures the break in the series after the currency reforms that tamed hyperinflation.
Gold standard	A dummy taking the value of 1 for the years that Poland was on the gold standard (October 1927 through April 1936), 0 otherwise.
Fiscal capacity	The natural log of the nominal amount of money taken in by the national government in direct taxation, expressed in USD. Data de-trended to remove strong seasonality from the underlying series.
Political turnover	A dummy variable taking the value of 1 in the month that there was a change of government/Prime Minister, and 0 otherwise. As noted in the text, any fall in government, even those that retained the same PM, is coded as 1 here.
Party fractionalization	An index of the form $F = 1 - \sum_{i=1}^{m} t_i^2$, where t_i is the proportion of members associated with the ith party in the lower house of the legislature (in this case, the *Sejm*).
Industrial production	Index of industrial production, base year 1928 = 100, augmented as noted below.
Exports	The natural log of the volume of exports for that month, measured in metric tons. Given the seasonality of exports, an HP filter using the same specifications as all other de-trended data (i.e. $\lambda = 129{,}600$) was used on the raw data.
Coal production	Amount of coal extracted from all Polish territories, in thousands of metric tons. Production after and including 1922 includes Upper Silesia, which acceded to Poland after a 1921 plebiscite in favor. Series de-trended to account for seasonality.
Emigration	Raw number of emigrants from Poland in that month, de-trended to account for seasonal variation.

of law, colonial origin, is also difficult to code here due to the separation of Poland into three Partitions across three competing Empires in the centuries preceding independence. Perhaps the most promising of the commonly-used correlates, ethnolinguistic fractionalization, suffers doubly in the Polish case from relative time-invariance and data issues: not only is the data available only for two points during the interwar period (due to the General Censuses of 1921 and 1931), there were well-known and politically motivated attempts to manipulate the language and ethnicity data from the 1931 Census, leading to underrepresentation of ethnic minorities, especially Jews and Ukrainians (Corrsin, 1998).

Given these issues, other solutions must be found to explain changes in the rule of law in interwar Poland. For this examination, a set of covariates will be used, divided into three separate categories, ordered in terms of their possible influence: political determinants, macroeconomic determinants, and monetary regime-specific determinants (a complete description is shown in Table 1 and in the Data Appendix).

4.1.1. Political determinants

As "rule of law" is a political concept, it is natural that there would be political determinants and institutional factors influencing its level. Krone (2014) offers an extensive list of political and social determinants of the rule of law, including the aforementioned attributes (ethnolinguistic fractionalization, religion), but we must search at a more micro-oriented level to understand the political factors specifically related to Poland.

One area of promise found in the political science literature as a key determinant of executive constraints and which is highly relevant to interwar Poland is the frequency of turnover of the executive. Besley et al. (2016) and Karakas (2016) show that leaders who have a lower probability of being replaced are less likely to introduce reforms that constrain the executive, while leaders who are faced with the possibility of being out of power are more likely to attempt to constrain their successors. To measure the effect

of turnover in the Polish case, I examine Prime Ministerial and governmental changes on a monthly basis, creating a new time-series coded as 1 in the month that the Prime Minister was changed (even if the government change resulted in the same person being appointed Prime Minister, as happened in 1922 with Antoni Ponikowski and three times in 1926 with Kazimierz Bartel) and 0 otherwise.[18] Given the high probability of a Prime Minister being replaced in the early years of the Second Republic, it is likely that turnover did have an effect on the rule of law. Additionally, given the slow-moving nature of the dependent variable, the turnover in the executive may also capture underlying measures of the political state of Poland. In fact, given that degradation of rule of law in any country is not instantaneous, turnover should provide a proxy of societal trends which would need to reach a certain threshold before feeding through to the rule of law measure; however, turnover would continuously affect money growth, due specifically to the incentives of politicians.[19]

Similarly, much work has been done in political science on the need for multiple veto points in order to preserve rule of law (Tsebelis, 1995), but the presence of a fragmented party system may also degrade a rules-based regime. As Andrews and Montinola (2004:83) note, "highly fragmented party systems in combination with presidential regimes hinder the development of the rule of law, whereas party fragmentation in parliamentary systems facilitates its development." To control for the effects of party fractionalization in the interwar period, a fractionalization index, extrapolated from the Cross-National Time Series Database and amended to be monthly (rather than annual), will be included as a political control.

As a final attribute of the political system, included here is also fiscal capacity of the state, measured by the amount of direct tax that was taken in by the Polish government. The Second Republic's fiscal capacity could have both influenced inflation and the rule of law in the interwar period; in the first instance, lack of fiscal depth would have meant a necessary recourse to the printing press in order to cover government expenditures, resulting in higher-than-necessary inflation. Second, a government attempting to unify three distinct regions of Poland, as well as the various regions conquered (East Galicia and the *Kresy* region) or absorbed by plebiscite (Upper Silesia), would need some financial depth in order to secure a uniform legal system across these territories. Without fiscal capacity, it could be expected that rule of law might suffer, especially given the competing visions of rule of law which predominated in Poland's eastern (formerly Russian) territories.[20]

4.1.2. Macroeconomic determinants

Whereas political institutions, as the generator and guarantor of rule of law, may have played an influential role in Poland's political transition during the interwar period, it is also plausible that macroeconomic variables apart from monetary policy influenced the path of political development. But while other suitable candidates for controls emerge from the macroeconomic conditions faced by the Second Republic, many of which could play a role in the development of rule of law in a young country, these indicators also have problems regarding data availability. In the first instance, democracy and rule of law tend to be associated with economic growth, and thus including a suitable proxy for economic activity could isolate these effects (Skaaning, 2010). Unfortunately, indices of industrial production on a monthly basis are limited for Poland for the interwar period: data from *Instytut Badania Konjunktur Gospodarczych i Cen* (the Research Institute for Business Cycles and Prices) could only be traced back to January 1922, while other sources such as the League of Nations (1945) had annual data and the *Statistisches Jahrbuch für das Deutsche Reich* (Statistical Yearbook for Germany) had a different series of indices starting in 1925.

To cope with this issue, I use several different proxies for economic activity in interwar Poland (see Data Appendix for a description of sources and methods). The first is a measure of unemployment, the number of registered unemployed monthly, obtained from Drecki (1929) for 1919 through 1928 and thereafter by *Główny Urząd Statystyczny* (GUS, the Polish Central Statistical Office). Given that unemployment is a lagging indicator of economic distress, and given that the appearance of unemployment may take time to translate into political changes, I have seasonally smoothed the series using a Hodrick–Prescott (HP) filter at a high smoothing parameter (129,600 for monthly data, as suggested by Ravn and Uhlig, 2002). Second, a vibrant economy should be expected to see its exports increasing, and thus I also use the natural log of exports (by volume) as a further indicator of economic activity, but unfortunately one which begins only in 1920.

Other country-specific traits are also used as controls here, derived from the literature and Poland's unique history, to proxy for the state of a country's rule of law. As noted by Norman (2009) and Møller and Skaaning (2014) among others, natural resource abundance is often negatively correlated with rule of law, with rents creating a source of corruption and stifling political competition (Bulte and Damania, 2008). Along these lines, coal was a valuable resource which Poland had a comparative advantage in during the interwar period, and thus production of coal is used here as a proxy for resource dependence. Given the seasonality of coal production, it too has been de-trended using the HP filter.

Another area in which Poland excelled was in the export of its people, with massive levels of emigration from the country beginning in the late 19th century and continuing through the interwar period. It is plausible that emigration is also a key determinant of rule of law, although the direction of its influence is debatable. As Landgrave and Nowrasteh (2016) summarize, emigration could worsen the rule of law in a country if the best and brightest emigrate, leaving behind a strengthened current regime with an aversion to reform. On the other hand, as shown in Hirschman (1978) in relation to Ireland, emigration can also spur institutional reform at home, as elites are concerned that a critical mass of emigration could actually threaten the viability of the country. Moreover, "emigration can improve institutions… by increasing the political bargaining power of those who remain. Emigration can create a safety valve that

---

[18] This coding was based on the information contained in the MaxRange dataset and was cross-checked with the Cross-National Time Series dataset, which contains annual data on the number of major cabinet changes in Poland occurring over 1918-1939.
[19] Thanks to John Leahy for suggesting the need to address underlying, faster-moving trends.
[20] Thanks to an anonymous referee for pointing out how fiscal capacity could influence both attributes of interest here.

decreases the cost of dissent because the dissenter can conceivably leave" (Landgrave and Nowrasteh, 2016:2). In our example here, these channels may have prevented overreach by the government of newly-independent Poland, who needed to keep skilled workers in the country, while also allowing for better bargaining power of the intelligentsia in crafting Poland's new institutions. In other words, although we know that Poland did become an authoritarian state by 1939, it is possible that it would have succumbed to full fascism or communism earlier if there had not been the outlet of emigration.

4.1.3. Monetary regime-specific determinants

Finally, monetary policy is our key independent variable of interest, but monetary policy could influence the rule of law only through monetary institutions, and interwar Poland had several policy and institutional regime shifts during the Second Republic. Moving from fiat money with some gold/foreign currency backing in 1919 to 1926 to a full gold standard in late 1927, and then abandoning the gold standard in 1936 and returning to fiat money, Poland's monetary institutions were evolving and changing constantly. Such changes must also be accounted for, as it could have been a particular monetary regime which influenced rule of law rather than overall monetary policy. Of these regimes, it is likely that the shift to gold would have had the largest impact as it directly affected the creation of currency (and thus impacted the rule of law). To account for this change in regime, I have included a dummy variable equal to 1 for each month that Poland was on the full gold standard and 0 otherwise. Such a shift in monetary regimes could also capture underlying political currents that are not captured by the many political variables just described—that is, the geopolitical reasoning behind adopting and retaining the gold standard.

In addition, the reality of the interwar period is that Poland also underwent a structural break in its monetary policy following the currency reforms of 1924, from a hyperinflationary rush to a more "normal" policy framework. A time dummy is included in the regressions to account for this break, coded as 0 for every month prior to the currency reform (April 1924) and 1 for every month thereafter; this formulation will allow for capturing changes in monetary policy formulation in addition to the actual policies proxied by the PPI/exchange rate/policy stance variables.

4.2. Choice of estimator

The identification approach using a theory of the rule of law needs some additional clarification in terms of estimation. As the regime value indicator is slow-moving, even with our higher-frequency dataset, ordinary least squares (OLS) or time-series techniques may not be sufficient to understand the deeper relationships between the rule of law and monetary policy. Moreover, the speed of motion of the regime value (shown in Fig. 1) may send inappropriate signals regarding the presence of a unit root (Francis and Ramey, 2009); in particular, a battery of stationarity tests performed on the regime value indicator showed weak stationarity (generally clustered in the 5–15% significance range, depending upon the test utilized).[21] Given these stylized facts, the preferred estimator for the empirical examination is a Poisson regression, an approach common in the operations literature for inventory and other slow-moving goods (Williams, 1984) but also utilized in settings such as trade negotiations (Pahre, 2001) and energy market reforms (Erdogdu, 2013).[22] A Poisson regression is also applicable in this case, as we are essentially estimating a "demand for rule of law," with (as Granger and Jeon (2003:6) said in the context of financial crises) "exceptional events occurring with a Poisson process having a stochastically varying intensity, so that the probability of an event happening is changing." The Poisson approach, however, imposes the strict condition that a series have equidispersion—that is, an equal conditional mean and conditional variance, a condition which is not fulfilled for the majority of our data (see Fig. 8 for a visualization of the data and Table 2 for summary statistics).[23] To correct for the overdispersion of our monetary policy variables, we instead utilize a negative binomial (NB) approach, designed to handle overdispersion in the data. The NB estimation is done via a quasi-generalized pseudo-maximum likelihood estimator as shown in Gourieroux et al. (1984), with the variance parameter obtained from the results of the Wooldridge (1997) overdispersion test. To account for heteroskedasticity and misspecification of the conditional distribution of the dependent variable, we also utilize Generalized Linear Model (GLM) robust standard errors.

An issue that may arise is that even these generalized linear models assume the strict exogeneity of monetary policy, a condition that is difficult to satisfy even in a zero-history environment like the beginning of the Second Polish Republic. As a further robustness check, I also use an instrumental variables (IV) Poisson generalized method of moments (GMM) estimator as formulated by Mullahy (1997) and Windmeijer and Santos Silva (1997). This model takes the general form of:

$$y_i = \exp\left(x'_i \beta_1 + y'_{2,i} \beta_2\right) + \epsilon_i \tag{4}$$

Where the dependent variable y is a function of a matrix of exogenous regressors (x'), endogenous regressors (shown in Eq. (4) as y_2), and an error term ϵ (this version of the model uses additive errors, there also is a variant where the errors are multiplicative).

---

[21] The results of Augmented Dickey-Fuller (ADF), Kwiatkowski–Phillips–Schmidt–Shin (KPSS), and Ng-Perron unit root tests showed stationarity at the 10% level, while the Elliott-Rothenberg-Stock and Dickey-Fuller-GLS (DF-GLS) tests showed stationarity at the 5% level. Alternately, the Phillips-Perron test showed non-stationarity (15% level) while an ADF test including additive outliers to account for a structural break gave results of strong non-stationary (*p*-value of 0.43 versus the null of a unit root).

[22] Poisson estimation is a form of generalized linear modeling which requires a non-negative dependent variable and solves the likelihood function for n independent Poisson observations as a product of probabilities given by $\Pr\{Y = y\} = \mu^y e^{-\mu}/y!$.

[23] The results of Wooldridge (1997) residual-based testing for each monetary policy variable rejected decisively the null of equidispersion, instead showing slight (but significant) overdispersion in the data. Results available from the author on request.
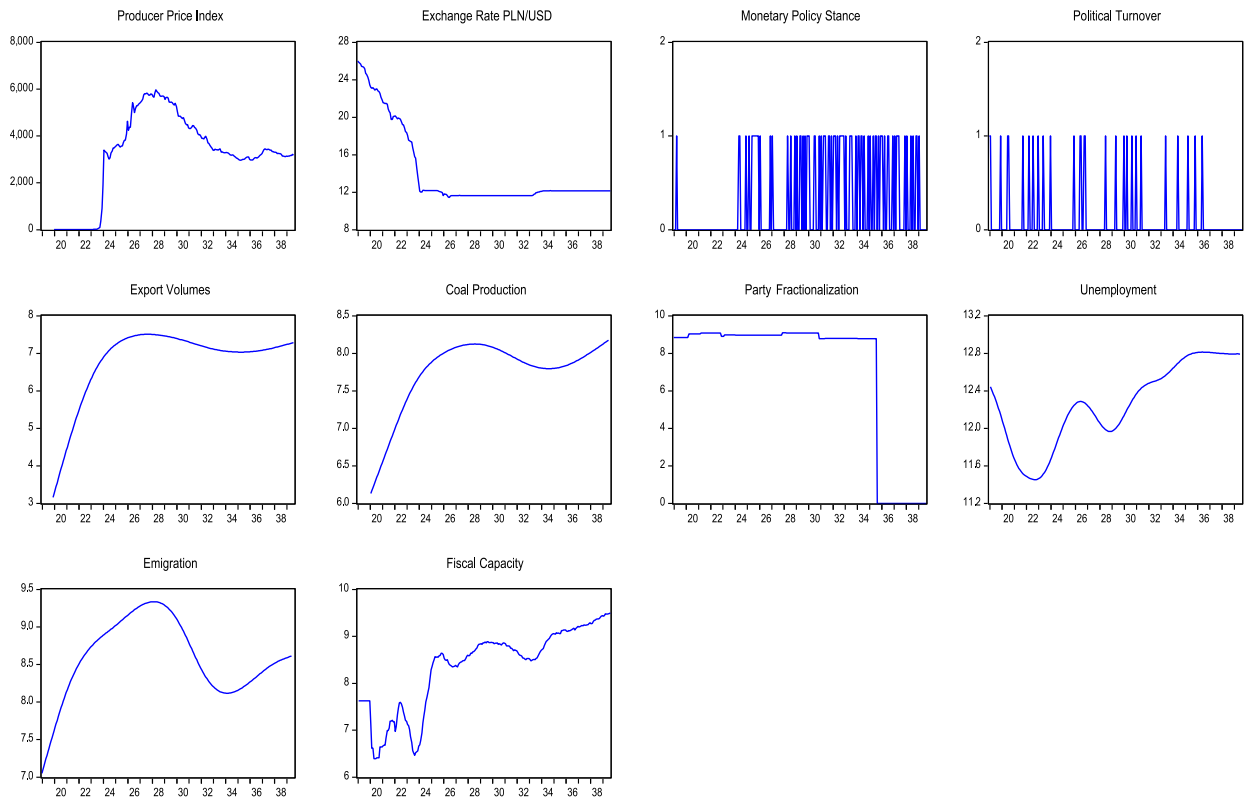
Fig. 8. Visualization of all variables.

GMM estimation then uses instruments for the endogenous regressors (denoted as z_i) to specify moment conditions that hold in the population, solving a minimization problem to make the sample-moment conditions as close to zero as is possible.

The use of instrumental variable techniques in time-series data, while uncommon compared to VAR estimation, is not unheard of, especially in relation to monetary policy. In fact, many of the examinations of Taylor Rules in single countries rely on some form of IV or GMM estimation, including inter alia Hayo and Hofmann (2006), Consolo and Favero (2009), Vašíček (2010), or Koustas and Lamarche (2012). However, it is in studies examining institutional change and institutional break-down (areas where an explicit theoretical approach is called for) that IV estimation (and especially IV-Poisson approaches) of time-series data has begun to flourish. Dube and Vargas (2013) are perhaps the most relevant example of this approach, as they examine conflict incidence in Colombia using an explicit IV-Poisson estimator to account for commodity production; along similar lines, Henderson and Kuncoro (2004) model corruption in Indonesia using instruments for fiscal capacity in an IV-Poisson framework. Other examples of the use of IV-Poisson estimation in relation to institutions in a single country come from Vézina (2012), who models trade in Switzerland as a function of informal institutional change using a variety of IV techniques, including an IV-Poisson estimator, and Czarnitzki and Kraft (2009), who examine innovation in German manufacturing via IV-Tobit and IV-Poisson methods.

To select a suitable instrument set, the instrumentation strategy used here is based on "general to specific" (GETS) modelling. The GETS approach is straightforward, sequentially dropping insignificant regressors via *t*-statistics and joint F-tests in order to reach a parsimonious model (Hendry, 2000). Once this model has been obtained, however, the insignificant variables can be employed as instruments for the remaining endogenous variables (in this case, monetary policy), as they satisfy the restriction exclusion: that is, these variables are already excluded from the model of interest via lack of influence on the dependent variable, with their only effect occurring in the first-stage of the regression (Angrist and Pischke, 2008). This approach was developed by Lawson and Wang (2005) in the context of Central and Eastern European transition economies, and further implemented by Berkowitz and DeJong (2005), Gerlach and Peng (2005, in the context of monetary policy), Saxegaard (2006), and Kalyuzhnova et al. (2009). More importantly from a theoretical standpoint, this strategy encompasses the reality that some macroeconomic or political variables may act on the rule of law through indirect, rather than direct, channels. Further tests on the suitability of the instrument set will be verified via results from Hansen's test of overidentifying restrictions and, most importantly, by recourse to the literature and underlying economic theory. As with the NB estimation, robust standard errors are used.

5. Results of the empirical examination

Beginning with the negative binomial model, the results can be seen in Tables 3–6. For the monetary policy variables, a step-wise addition of control variables is utilized, starting with a simple bivariate regression and then increasing the number of controls until

Table 2
Summary statistics.

Variable	Summary statistics					
	Mean	Median	Max	Min	Std. Deviation	n
Rule of Law Variables						
Regime value	46.41	34.00	100.00	6.00	31.80	249
Executive constraints	5.30	5.00	7.00	3.00	1.473	249
Fascism transition	0.02	0.00	1.00	0.00	0.126	249
Fascism momentum	0.72	0.00	4.00	0.00	1.107	249
Average Polity	0.658	1.89	4.63	−5.67	3.53	249
War	0.01	0.00	1.00	0.00	0.297	249
Currency and controls						
Producer Price Index	3194.60	3329.20	5974.32	0.01	1845.74	237
Polish currency to USD exchange rate	6,630,000,000.00	188,630.70	198,000,000,000.00	91,800.56	27,300,000,000.00	206
Monetary Policy Stance	0.32	0.00	1.00	0.00	0.47	249
Regime dummy	0.739	1.00	1.00	0.00	0.44	249
Gold standard	0.41	0.00	1.00	0.00	0.493	249
Fiscal capacity	8.35	8.60	9.50	6.40	0.87	248
Political turnover	0.11	0.00	1.00	0.00	0.32	249
Political fractionalization	8.94	8.97	9.10	8.78	0.12	249
Industrial production	81.85	76.15	129.80	46.50	21.61	174
Exports and Imports	6.82	7.14	7.98	−0.66	1.13	237
Coal production	7.67	7.92	8.39	5.33	0.67	245
Emigration	8.59	8.56	9.34	7.05	0.52	246

the full model is reached as described in the previous section. This approach follows the identification strategy of Section 4 in that it makes recourse to a theory of determinants of rule of law. In this approach, starting from the variable of interest (monetary policy), we add controls based on their likelihood of influence on rule of law: first, political institutions and their functioning are included (assuming rule of law as a political creature), and then the macroeconomic controls are added to see if the theorized relationship continues to hold.

Several observations stand out immediately from the analysis. In the first instance, the preferred metric for monetary policy, the PPI, has a consistent effect across stepwise regressions (Table 3), negatively related to Poland's rule of law. In regard to producer prices, a higher PPI corresponds with a very small economic effect on the rule of law, as a 100% increase in Poland's PPI would correlate with only a drop of two points in the regime value indicator.[24] The reasons behind this relatively small effect may be due to the fact that producer prices do not adjust immediately to changes in monetary policy (a large body of evidence suggests that producer prices change infrequently and in small amounts), and thus much of the effect on rule of law by monetary policy may already be priced in by the time producers adjust.

Some evidence is given for this theory when looking at the effect of the exchange rate on rule of law (Table 4). In the first instance, the exchange rate indicator has the unenviable task of proxying for nearly all macroeconomic variables in the early regressions, but as additional controls are added (and in particular unemployment), the "true" effects of the exchange rate become apparent. However, when we control for unemployment and other macroeconomic variables, each 100% increase in the złoty/USD exchange rate appears to correlate with a drop of approximately 15% in the regime value indicator. Put another way, a rise in the official gold standard exchange rate of 8.90 to 17.80 złoty per dollar would result in the difference between Poland being coded as having a "Qualified democratic indirect Presidentialism" and one that has a "Semi-Democratic Presidentialism" (on the MaxRange scale, as shown in Appendix A).

Comparable results are found when examining the dichotomous monetary policy stance variable in Tables 5 and 6: as the coding of the dummy is reversed (i.e. 1 for tightening), positive numbers signify the counterfactual, namely an increase in the rule of law due to monetary tightening. As with the exchange rate, such a broad variable is absorbing many macroeconomic effects when left on its own, but once labour movements are accounted for, monetary policy effects become clear and incredibly significant: indeed, on average, monetary tightening in the interwar Polish Republic was associated with a rise in the regime variable of 10%, while continuous tightening over an entire quarter resulted in a 22% increase in the regime variable (Table 6).

These results hold with the addition of a full set of covariates, most of which are also significant and with a similar (if slightly larger) economic effect, as predicted by theory. For example, every percentage point rise in coal production in Poland is associated with between a 1% to 2% drop in the regime value, while a percentage increase in party fractionalization consistently yields about a 0.10% increase in the regime value. Openness, as proxied by exports, appears to be unequivocally good for keeping a regime open as well, as does having many parties in parliament. Of immense interest is also the effect of the gold standard on the rule of law, which,

---

[24] However, the effect is highly persistent at much deeper lags. See Appendix B, which includes the coefficients and t-stats from the full model using lags over three years.

Table 3
Baseline negative binomial regressions: producer price index.

	1	2	3	4	5	6	7	8	9	10
Producer Price Index	−0.0001	−0.0001	−0.0001	−0.00004	−0.0002	−0.0002	−0.0001	−0.0001	−0.0001	−0.0002
	6.53***	3.74***	3.70***	3.35***	7.43***	9.15***	3.23***	2.52**	2.53***	4.48***
Gold Standard Dummy		−0.48	−0.48	−0.75	−0.76	−0.52	−0.60	−0.49	−0.47	−0.32
		5.54***	5.54***	15.43***	16.55***	8.40***	8.37***	6.37***	5.46***	4.43***
Political Turnover			0.04	−0.08	−0.09	−0.11	−0.10	−0.11	−0.11	−0.07
			0.37	1.32	1.50	1.98**	1.81*	1.99**	2.00**	1.39
Party Fractionalization				0.20	0.22	0.18	0.17	0.14	0.14	0.12
				29.92***	30.14***	20.50***	17.28***	11.49***	11.06***	11.63***
Coal Production					0.51	0.27	0.47	−1.59	−1.60	−1.39
					6.78***	3.22***	3.91***	2.58***	2.59***	2.98***
Emigration						0.46	0.04	0.32	0.35	0.46
						5.66***	0.19	1.55	1.55	2.26**
Unemployment trend							−0.41	−0.21	−0.17	−0.36
							2.32**	1.18	0.79	1.63
Log Exports								0.84	0.84	0.70
								3.41***	3.42***	3.66***
Fiscal capacity									−0.02	−0.19
									0.32	2.69***
Monetary Regime Dummy										0.69
										4.56***
C	4.23	4.22	4.21	2.63	−1.11	−2.94	4.07	9.45	8.96	10.88
	52.45***	63.30***	61.28***	41.02***	2.01**	4.69***	1.32	2.80***	2.42**	2.97***
n	237	237	237	237	234	233	233	233	233	233
sample	1919M1-1939M8	1919M1-1939M8	1919M1-1939M8	1919M1-1939M8	1920M1-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6
adjusted R-squared	0.21	0.26	0.26	0.72	0.75	0.79	0.80	0.80	0.80	0.81
QML parameter	0.333872	0.300091	0.297387	0.085315	0.0670725	0.052147	0.050715	0.048381	0.04837	3.586328

Absolute value of *t*-statistics under coefficients. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively.

Table 4
Baseline negative binomial regressions: PLN/USD exchange rate.

	1	2	3	4	5	6	7	8	9	10
PLN/USD Exchange Rate	0.07	0.04	0.04	−0.004	0.03	−0.03	−0.13	−0.12	−0.16	−0.15
	6.08***	*4.07****	*4.02****	*0.77*	*1.26*	*1.17*	*4.75****	*4.40****	*5.25****	*4.29****
Gold Standard Dummy		−0.50	−0.50	−0.85	−0.83	−0.64	−0.71	−0.57	−0.67	−0.67
		6.07***	*6.07****	*18.43****	*17.11****	*11.20****	*12.81****	*8.38****	*8.64****	*8.57****
Political Turnover			0.02	−0.06	−0.08	−0.06	−0.06	−0.08	−0.07	−0.07
			0.16	*1.01*	*1.20*	*0.92*	*1.20*	*1.46*	*1.30*	*1.24*
Party Fractionalization				0.20	0.20	0.17	0.14	0.11	0.12	0.12
				29.92***	*28.82****	*19.88****	*12.40****	*9.30****	*9.58****	*9.05****
Coal Production					0.21	−0.51	−0.24	−2.20	−2.15	−2.11
					1.43***	*2.26***	*1.15*	*3.59****	*3.47****	*3.37****
Emigration						0.36	−0.43	−0.03	−0.24	−0.27
						3.81***	*3.97****	*0.22*	*1.41*	*1.50*
Unemployment trend							−1.16	−0.82	−1.24	−1.27
							10.17***	*5.65****	*5.97****	*5.95****
Log Exports								0.82	0.69	0.70
								3.40***	*2.77****	*2.80****
Fiscal capacity									0.19	0.17
									2.83***	*2.08***
Monetary Regime Dummy										0.09
										0.57
C	2.85	3.41	3.41	2.56	0.49	3.89	24.45	26.37	32.76	32.92
	17.62***	*21.11****	*21.10****	*30.18****	*0.34*	*2.41***	*8.91****	*9.88****	*9.38****	*9.40****
n	248	248	248	248	234	233	233	233	233	233
sample	1919M1-1939M8	1919M1-1939M8	1919M1-1939M8	1919M1-1939M8	1920M2-1939M7	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6
adjusted R-squared	0.15	0.25	0.24	0.71	0.70	0.67	0.80	0.82	0.82	0.82
QML parameter	0.340779	0.292492	0.292354	0.083156	0.0904	8.05722	0.048919	0.04428	0.041824	0.041601

Absolute value of *t*-statistics under coefficients. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively.

Table 5
Baseline negative binomial regressions: monthly monetary policy stance.

	1	2	3	4	5	6	7	8	9	10
Monetary policy Stance	−0.31	−0.10	−0.10	0.07	0.07	0.09	0.12	0.12	0.12	0.10
	3.37***	1.31	1.26	1.67*	1.50	1.97**	2.94***	2.95***	2.95***	2.34**
Gold Standard Dummy		−0.65	−0.64	−0.86	−0.87	−0.76	−0.63	−0.59	−0.59	−0.59
		9.14***	9.06***	20.99***	18.41***	12.79***	11.69***	8.61***	7.66***	7.69***
Political Turnover			0.07	−0.06	−0.07	−0.08	−0.07	−0.10	−0.10	−0.08
			0.66	1.09	1.12	1.33	1.23	1.86*	1.86*	1.42
Party Fractionalization				0.20	0.20	0.19	0.14	0.13	0.13	0.12
				31.37***	29.05***	20.17***	17.09***	11.25***	10.55***	9.05***
Coal Production					0.02	−0.18	0.49	−1.74	−1.74	−1.68
					0.45	2.15**	4.07***	2.81***	2.81***	2.71***
Emigration						0.24	−0.41	−0.03	−0.02	−0.17
						2.96***	3.49***	0.19	0.13	0.94
Unemployment trend							−0.95	−0.57	−0.56	−0.83
							8.45***	4.36***	3.43***	4.31***
Log Exports								0.94	0.94	0.91
								3.84***	3.84***	3.73***
Fiscal capacity									−0.008	−0.06
									0.12	0.99
Monetary Regime Dummy										0.36
										2.60***
C	3.93	4.08	4.06	2.49	2.32	1.87	14.19	17.19	17.07	21.63
	75.48***	91.89***	87.24***	45.30***	5.95***	4.52***	9.51***	10.84***	9.26***	8.62***
n	249	249	248	248	234	233	233	233	233	233
sample	1918M12-1939M8	1918M12-1939M8	1919M1-1939M8	1919M1-1939M8	1920M2-1939M7	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6
adjusted R-squared	0.04	0.19	0.19	0.71	0.71	0.70	0.79	0.81	0.82	0.82
QML parameter	0.41952	0.32158	0.32296	0.081747	0.088555	0.08922	3.986015	0.045315	0.045313	0.043991

Absolute value of *t*-statistics under coefficients. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively.

Table 6

Baseline negative binomial regressions: quarterly monetary policy stance.

	1	2	3	4	5	6	7	8	9	10
Monetary Policy Stance Quarterly	−0.03	0.10	0.10	0.13	0.14	0.15	0.19	0.18	0.18	0.22
	0.25	0.97	1.00	2.20**	2.17**	2.48**	3.42***	3.36***	3.36***	3.94***
Gold Standard Dummy		−0.69	−0.68	−0.79	−0.77	−0.75	−0.75	−0.58	−0.58	−0.63
		10.26***	10.15***	20.04***	16.94***	12.68***	13.36***	8.48***	7.55***	6.54***
Political Turnover			0.08	−0.03	−0.04	−0.07	−0.08	−0.09	−0.09	−0.10
			0.75	0.47	0.58	1.21	1.43	1.69*	1.69*	1.88*
Party Fractionalization				0.19	0.19	0.18	0.16	0.13	0.13	0.13
				35.65***	32.17***	20.00***	16.39***	11.16***	10.47***	7.42***
Coal Production					−0.04	−0.17	0.61	−1.70	−1.70	−1.74
					0.67	2.12**	5.50***	2.76***	2.76***	2.14**
Emigration						0.24	−0.49	−0.04	−0.04	−0.19
						2.95***	4.54***	0.27	0.21	0.91
Unemployment trend							−0.92	−0.58	−0.57	−0.79
							9.18***	4.41***	3.49***	3.92***
Log Exports								0.93	0.93	0.97
								3.82***	3.81***	3.02***
Fiscal capacity									−0.005	−0.05
									0.09	0.87
Monetary Regime Dummy										0.31
										2.71***
C	3.84	4.05	4.04	2.54	2.82	1.87	13.53	17.14	17.05	21.26
	83.49***	95.42***	90.31***	56.66***	6.79***	4.55***	10.17***	10.87***	9.30***	9.13***
n	249	249	248	248	234	233	233	233	233	233
sample	1918M12-1939M8	1918M12-1939M8	1919M1-1939M8	1919M1-1939M8	1920M2-1939M7	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6
adjusted R-squared	0.003	0.19	0.19	0.71	0.69	0.70	0.81	0.82	0.81	0.83
QML parameter	0.445816	0.32148	0.322432	7.009119	7.667092	0.087935	0.0473933	0.044815	0.044815	0.001309

Absolute value of *t*-statistics under coefficients. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively.

as theorized above, appeared to be a tool for the *Sanacja* regime to maintain its power. The empirical results also show the time that Poland was on the gold standard to be significantly and negatively correlated with rule of law, perhaps confirming this thesis. Indeed, whereas a gold standard should, ceteris paribus, be anticipated to contribute to the rule of law, if it is implemented under a situation of pre-existing authoritarianism, it could have the opposite effect.[25]

5.1. Robustness tests

These results show a statistically significant relationship between monetary profligacy and the decline of the rule of in interwar Poland. However, there may be other issues present, independent of monetary policy, which could have contributed to the erosion of rule of law in the Second Republic, including the wave of fascism which took hold in the 1930s across Europe. In an inversion of Csordás and Ludwig (2011), who showed that democratic transitions in a country are strongly influenced by transitions in their neighbours, perhaps Poland's move to fascism and away from rule of law was influenced by the general environment of Central and Eastern Europe at the time. That is, perhaps fascist transitions in the neighbourhood of Poland, in particular in Germany and Austria (former colonial masters of Poland but still with strong ties to the Polish economy), had a disproportionate effect on Poland's own political transition.

To capture this effect econometrically, I use two separate dummy variables on the full models from the previous section: the first is a categorical variable equal to the cumulative number of neighbours of Poland that were fascist in any given month, while the second dummy focuses on fascist transitions, coded 1 for a month in which a neighbouring country experienced a fascist transition and 0 otherwise. As an additional check, much like Csordás and Ludwig (2011), I also use the average Polity IV democracy score of Poland's closest neighbours to examine authoritarian tendencies in the region;[26] this is done precisely because interwar Europe as a whole became increasingly more authoritarian during the 1930s, especially in Poland's neighbourhood, but only a few countries became explicitly fascist along the German or Italian model.[27]

The results of these robustness checks on the full models are shown in Table 7, and the inclusion of neither the cumulative fascist neighbours, fascist transitions, nor authoritarian tendencies has an effect on the overall relationship between monetary policy and the rule of law in Poland (macroeconomic and institutional controls are omitted to save space). In fact, the effects of a tightened monetary policy and of an increase in producer prices are strengthened, while the effect of a short-term monetary policy shift is less significant statistically. The developments in Poland's neighbourhood do seem to have had some influence on Poland's own political development, with the number of fascist neighbours weighing on Poland's rule of law and, conversely, higher average Polity IV scores associated with a higher regime value in Poland.

While the political developments of Poland's neighbours had some bearing on the development of its rule of law, perhaps the development of the global economy was more important; that is, in a total inversion of the hierarchy of institutions, perhaps it was the trend in the world economy during the interwar period which led to the erosion of the rule of law rather than monetary conditions in Poland. To test this possibility, I include three additional sets of regressions, one using data from the United States (US) to proxy for global economic trends, one using data from Poland's large neighbour Germany, and one accounting for regional conflict.

In the case of the US, industrial production data going back to the 1920s was readily available as an indicator of global economic trends. Additionally, given the importance of US capital markets to growth in the interwar period, monthly returns on the Dow Jones Industrial Average (DJIA) are used to capture market sentiment. Finally, as a trend indicator for global monetary policy, US year-on-year inflation indices are also included to see if Poland's monetary policy was merely playing follow-the-leader.[28] Table 8 shows the results of this extension of the basic model and, as with the inclusion of neighbourhood political variables, the US economic variables are significant (although the Dow Jones results are marginal and depend upon the specification used). In a perhaps odd result, the inclusion of the US variables shows that inflation abroad correlated with a strengthened rule of law at home and exactly the opposite for global economic trends; this may be due to Poland's own internal issues in overcoming challenges from independence, and may be a correlation rather than causation.[29] The inclusion of US economic indicators do not, however, vitiate the results of Poland's monetary indicators, which retain the same signs, significance, and economic effect.

A similar outcome is apparent when we include Germany's variables instead of those of the US (Table 9), on the assumption that Polish economic trends would more likely be influenced by closer countries which were more integrated with Poland. Germany did not have the same data series available as the US, and so I have instead used the log of German iron output to proxy for overall economic health, and, as in the case of Poland, Germany's PPI to proxy for inflation. Including German economic indicators reveal the same trends as seen with the US, with German industrial strength corresponding to slightly lower rule of law in Poland, and

---

[25] This assertion is not explicitly tested here, but makes an interesting avenue for future research.

[26] The countries used for this comparison include Austria, Czechoslovakia (through March 1939), Estonia, Germany, Hungary, Latvia, Lithuania, Romania, and the Soviet Union, chosen due to their geographic proximity.

[27] Hungary is a prime example of this effect, as the Kingdom remained conservative and became increasingly more militant and aligned with Nazi Germany as the 1930s progressed. However, as Blinkhorn (2014) notes, Hungary's authoritarianism, while substantial, never quite reached the fascist pitch of Germany until 1938, when it acquired a racial (anti-Jewish) and nationalist/militaristic fusion.

[28] Additional tests, not shown, experimented with deeper lags of these global variables. As expected, the effect of global economic conditions decayed fairly rapidly, with statistically significant results back one year but with diminishing economic importance. The inclusion of these variables at deeper lags only strengthened the impact of monetary policy on rule of law, both statistically and economically.

[29] See the Data Appendix for a description of the US and German variables and data sources.

Table 7
Robustness tests accounting for neighbourhood developments.

	1	2	3	4	5	6	7	8	9	10	11	12
Producer Price Index	−0.0002				−0.0002				−0.0002			
	4.13***				5.02***				4.88***			
PLN/USD Exchange Rate		−0.15				−0.13				−0.15		
		4.29***				3.93***				4.63***		
Monetary Policy Stance (monthly)			0.10				0.07				0.09	
			2.33**				1.74*				2.11**	
Monetary Policy Stance (quarterly)				0.19				0.14				0.17
				3.57***				2.68***				3.16***
Fascist Transitions	−0.03	−0.02	−0.01	0.01								
	0.15	0.12	0.05	0.06								
Fascist neighbours					−0.20	−0.15	−0.16	−0.14				
					5.20***	3.93***	4.06***	3.64***				
Average Polity IV									0.06	0.05	0.04	0.04
									3.89***	3.39***	2.82***	2.45**
C	10.98	32.92	21.63	21.73	9.07	31.65	21.74	21.81	7.73	32.23	20.64	20.87
	2.99***	9.40***	8.62***	8.81***	2.59***	9.36***	9.00***	9.13***	2.12**	9.48***	8.35***	8.54***
n	233	233	233	233	233	233	233	233	233	233	233	233
sample	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6
adjusted R-squared	0.82	0.83	0.82	0.82	0.83	0.84	0.83	0.83	0.82	0.82	0.81	0.82
QML parameter	0.042493	0.04158	0.043984	0.042344	0.037064	0.037298	0.039802	0.0391	0.041773	0.041686	0.044114	0.042515

Absolute value of *t*-statistics under coefficients. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively. Macroeconomic and institutional controls included but not shown for reasons of space

Table 8

Robustness tests including US production/inflation.

	1	2	3	4	5	6	7	8
Producer Price Index	−0.0001				−0.0002			
	3.02***				4.10***			
PLN/USD Exchange Rate		−0.14				−0.15		
		4.51***				4.42***		
Monetary Policy Stance (monthly)			0.10				0.10	
			2.47**				2.32**	
Monetary Policy Stance (quarterly)				0.18				0.19
				3.40***				3.46***
US Industrial Production (−1)	−0.16	−0.17	−0.18	−0.17				
	4.06***	4.48***	4.56***	4.25***				
US Inflation (−1)	2.32	2.69	2.70	2.61				
	4.61***	5.62***	5.54***	5.37***				
Dow Jones Returns					−0.79	−0.96	−0.82	−0.71
					1.64	1.98**	1.68*	1.46
C	15.63	35.09	23.87	24.21	11.58	33.78	22.15	22.19
	3.91***	9.99***	8.83***	9.08***	3.15***	9.63***	8.80***	8.95***
n	233	233	233	233	233	233	233	233
adjusted R-squared	0.84	0.84	0.84	0.84	0.82	0.82	0.82	0.82
QML parameter	0.035474	0.033446	0.035156	0.034947	0.042207	0.040741	0.043624	0.04212

Absolute value of *t*-statistics under coefficients. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively. Macroeconomic and institutional controls included but not shown for reasons of space

Table 9

Robustness tests including german economic conditions.

	1	2	3	4
Producer Price Index	−0.0004			
	8.77***			
PLN/USD Exchange Rate		−0.13		
		2.90***		
Monetary Policy Stance (monthly)			0.09	
			2.06**	
Monetary Policy Stance (quarterly)				0.18
				3.29***
German Iron Production (−1)	−1.19	−0.08	−0.36	−0.34
	8.39***	0.51	2.90***	2.81***
German PPI (−1)	0.04	0.03	0.04	0.04
	3.70***	2.54***	3.15***	3.17***
War				
C	−6.60	34.46	24.33	24.39
	1.53	8.15***	8.99***	9.16***
n	233	233	233	233
sample	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6
adjusted R-squared	0.84	0.82	0.82	0.83
QML parameter	0.033649	0.036945	0.039615	0.037967

Absolute value of *t*-statistics under coefficients. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively. Macroeconomic and institutional controls included but not shown for reasons of space.

German inflation corresponding with higher levels. In either case, the effect of Polish monetary policy on rule of law does not waver, and, as with the US, the direction and magnitude of the effect is mostly unchanged.

Finally, perhaps the encroachment of neighbours or Poland's own foreign adventurism had an effect on rule of law in Poland? It has long been argued that a negative correlation exists between war and the rule of law, with governments suspending legal niceties in pursuit of victory (Collier, 1999). Moreover, as the history of the Polish-Lithuanian Commonwealth showed, there also was a strong relationship between military conflict and monetary profligacy, with war leading to both currency debasement and the erosion of rule of law. This is another plausible explanator for Poland's decline in rule of law during the interwar period, as the Second Republic was involved in a number of armed clashes or outright wars occurring in its early years: conflict with Ukrainians in Galicia from November 1918 through July 1919 resulted in the absorption of eastern Galicia into Poland, while a Bolshevik invasion extended

Table 10
Robustness tests including the effects of war.

	1	2	3	4
Producer Price Index	−0.0002			
	4.07***			
PLN/USD Exchange Rate		−0.15		
		4.64***		
Monetary Policy Stance (monthly)			0.09	
			2.30**	
Monetary Policy Stance (quarterly)				0.19
				3.62***
War	0.54	0.59	0.56	0.56
	4.08***	*4.46****	*4.14****	*4.19****
C	15.74	37.79	26.00	26.06
	4.23***	*10.75****	*9.86****	*10.06****
n	233	233	233	233
sample	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6	1920M2-1939M6
adjusted R-squared	0.83	0.84	0.82	0.83
QML parameter	0.039223	0.036521	0.040093	0.038542

Absolute value of *t*-statistics under coefficients. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively.
Macroeconomic and institutional controls included but not shown for reasons of space.

this conflict through until early 1921 and nearly resulted in the dismemberment of the Republic (before the "Miracle on the Vistula" turned back the Russian invasion). On Poland's western front, there also were armed insurrections in Upper Silesia that were silenced only with the plebiscite that put the region into Polish hands, while to the north there was a brief war with Lithuania that was part of the broader struggle in Ukraine and Russia.

To test if war, rather than monetary policy, was the driving factor in Poland's deteriorating rule of law, I include a dummy variable to capture if Poland was engaged in conflict in that particular month, based on data in Brecke (1999). Results of these augmented regressions using the war dummy, shown in Table 10, show that Poland's wars, localized in the early years of its independence, actually had a salutary correlation with rule of law. This could be a statistical, rather than historical, relationship, due to the lack of conflict after 1921, or it could show an endogenous relationship between a democracy, seeking to unite the country territorially, and an autocracy, seeking to consolidate its gains. Regardless, the monetary policy variables all continue to have a similar effect on rule of law, even in the presence of conflict.

Finally, as noted above and just mentioned, these results from the negative binomial regressions could be plagued by endogeneity, in that monetary policy itself could be subject to the structure of political institutions and other macroeconomic outcomes. The strategy, noted above, utilizes all of the variables of the previous examination (including in the robustness regressions) from the outset to find a parsimonious model.[30] Once obtained, monetary policy in instrumented with the insignificant macroeconomic and institutional variables removed during the GETS procedure, in the manner of Lawson and Wang (2005), but with recourse to the literature on the determinants of monetary policy outcomes.

This approach yields surprisingly similar results to the NB estimations (Table 11), especially in regard to the PPI. Column 1 builds on an extensive literature on the non-political determinants of a country's PPI, including Feinberg (1986) and, more recently, Álvarez et al. (2010), which show how international competition, economic integration, and labor conditions affect producer price changes. Following this lead, we instrument Poland's PPI with the country's exposure to external factors (German PPI, export volumes, Dow Jones returns) and internal political ones (political turnover, unemployment, the monetary policy regime). As shown in Column 1, we obtain both the same tiny effect as seen in the NB regressions and a satisfactory pass on all econometric tests.[31] These effects hold across all of the IV Poisson regressions, including the exchange rate (Column 2), which shows a slightly stronger drag on rule of law when instrumented properly, and the monthly monetary policy stance (Column 3), which shows a much stronger effect on rule of law than in the NB regressions. Finally, Column 4 shows an incredibly strong relationship between the quarterly monetary policy stance and the rule of law, with each month preceded by a quarter of monetary tightening associated with an increase in the regime value of 2.24. For the most part, the covariates also act as expected, although the sign changes on emigration across variables and the effect of fascist transitions is different depending upon the monetary policy indicator utilized. Thus, the results for these particular

---

[30] Average Polity scores were not included in favor of the number of fascist neighbors. Including both of these variables would have created severe multicollinearity issues. A similar issue was found with the German iron production variable and US industrial production, which showed a correlation of 0.75. In this instance, the German number was included as a better representative of the regional economy.

[31] Two additional IV robustness tests, not shown here, were also run: an IV Poisson using a count function rather than a GMM estimator, and a plain IV-GMM estimation (using ivreg2 in Stata). Both of these tests confirmed the endogeneity of the PPI and the suitability of the instruments; indeed, the IV-GMM estimation showed a much stronger correlation between the PPI and the regime value in Poland, but this may have been due to the estimator not taking into account the slow-moving nature of the regime value indicator.

Table 11
IV poisson GMM robustness tests.

	1	2	3	4
Producer Price Index	−0.0004			
	*8.53***			
PLN/USD Exchange Rate		−0.21		
		*7.77***		
Monetary Policy Stance (monthly)			1.11	
			*4.22***	
Monetary Policy Stance (quarterly)				2.24
				*5.49***
Monetary Regime Dummy			−0.99	−1.38
			*5.38***	*9.01***
Coal Production				−1.04
				*2.40***
Gold Standard Dummy	−0.33	−1.06	−0.72	
	*4.32***	*17.23***	*6.76***	
Party Fractionalization	0.08	0.15	0.17	0.12
	*6.92***	*10.20***	*12.09***	*2.73***
Emigration	1.40	−1.69	0.48	2.51
	*9.17***	*7.41***	*9.93***	*3.60***
Fiscal capacity	0.48	0.42		
	*6.78***	*6.29***		
Fascist Transitions	−0.06	0.17		0.58
	*1.70**	*4.32***		*1.66**
Fascist neighbours	−0.16	−0.29		0.59
	*6.41***	*10.06***		*2.66***
US Inflation (−1)	1.24	1.75		
	*3.55***	*5.47***		
German Iron Production (−1)	−1.04			
	*9.85***			
German PPI (−1)				−0.04
				*2.15***
War	0.34			0.40
	*2.63***			*2.71***
C	−2.35	41.21		−4.31
	*2.70***	*9.99***		*2.34***
n	226	226	227	227
instruments	Regime dummy, German PPI, Export volumes, Political turnover, Coal production, Unemployment, Dow Jones returns	lags 2–4 of exchange rate, regime dummy, German PPI, Political turnover, Dow Jones returns, war, Export volumes, Coal production	Political turnover, Unemployment, Gold standard dummy, Export volumes, Dow Jones returns, Fiscal capacity, US inflation, Coal production, German iron production, Fascist transitions, Fascist neighbours, German PPI, war	Regime dummy, Political turnover, Unemployment, Gold standard dummy, Export volumes, Dow Jones returns, Fiscal capacity, US inflation
Hansen overid *p*-value	0.4392	0.4617	0.2629	0.3975

Absolute value of *t*-statistics under coefficients. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively.

controls should be treated with caution. Regardless, the overall picture regarding the effects of monetary policy—our variables of interest—appears to be consistent.

6. Conclusion

This paper has examined the role of monetary policy in undermining the rule of law in interwar Poland. Using a newly-compiled dataset of historical statistics and drawing on brand new data on political institutions, the econometric models utilized demonstrated a strong correlation between profligate monetary policies in the Second Republic and the decline in rule of law. This result was

robust to several alternate specifications and variables, correcting for the properties of the data and the different regimes that Polish monetary policy passed through between the two World Wars. It appears that the massive growth in the supply of money during the Second Republic's early years, coupled with later bursts of inflation, contributed to the degradation of the rule of law.

These relationships, while strong significantly, must be treated with caution, mainly due to the varying size of their economic effects, dependent upon the proxy for monetary policy utilized. We are not able to conclusively prove via an econometric exercise if there was a *direct* causal effect between Poland's monetary policies in the early 1920s and its descent into authoritarianism in the late 1930s; however, a reading of the historical record shows that this is in fact a *plausible* theory, and the econometric exercise contained here does appear to suggest a link (especially as we control for other plausible variables such as fascist transitions in neighbours or the presence of conflict). But given the multifaceted nature of the rule of law, and our nascent understanding of what drives it, it is difficult to point to monetary policy as the only determining factor in Poland's case. I believe that it was a major factor, but other aspects of national character, Poland's historical experience, and the effects of Partition may also have contributed.

Nonetheless, this research opens the door for a whole new avenue of exploration in economics, namely tying the development of macroeconomic indicators to institutional development instead of assuming institutions as either a given (a result of historical accidents) or as unilaterally affecting economic outcomes. Most importantly, this work has shown the importance of applying a much longer lens to macroeconomics, noting that every institution is in some way shaped by macroeconomic priors, even as they are shaping macroeconomic futures.

Acknowledgments

Appendix A. The maxrange coding scale.

Regime Value	Corresponding regime type
1	Absolute Governance
2	Absolute Monarchy
3	Parliamentary Absolute Presidentialism
4	Parliamentary Absolute Monarchy
5	Semi-Authoritarian Despotic Presidentialism
6	Genuine Military Junta
7	Institutionalized Military Junta
8	Enforced Absolutism
9	State of Martial Law
10	Absolute Colonialism
11	Hierarchical Parliamentary Military
12	Authoritarian Hierarchical Presidentialism
13	Authoritarian Hierarchical Semi-Presidential
14	Authoritarian Hierarchical Secretary General
15	Semi-Anarchism
16	Centralized Aristocratic Monarchism
17	Authoritarian Hierarchical Monarchism
18	De Facto Authoritarian Hierarchical Presidentialism
19	Authoritarian Dominating Presidentialism
20	Authoritarian Dominating Secretary General
21	Authoritarian Directorate
22	Authoritarian Hierarchical Non-Partyism
23	Institutionalized Colonialism
24	De Facto Authoritarian Dominating Presidentialism
25	Decentralized Aristocratic Monarchism
26	Semi-Authoritarian Hierarchical Presidentialism
27	Authoritarian Delegated Monarch

Regime Value	Corresponding regime type
28	Authoritarian Strong Presidentialism
29	Semi-Constitutional Centralized Military Interim Regime
30	Authoritarian Selected Presidentialism
31	De Facto Authoritarian Strong Presidentialism
32	Semi-Authoritarian Dominating Presidentialism
33	Semi-Authoritarian Dominating Semi-Presidentialism
34	Parliamentary Strong Military
35	Parliamentary Colonialism
36	Authoritarian Dominating Monarchism
37	Semi-Authoritarian Dominating Semi-Presidentialism
38	Semi-Authoritarian Strong Presidentialism
39	Authoritarian Decentralized Presidentialism
40	Authoritarian Decentralized Parliamentarism
41	False Democratic Hierarchical Presidentialism
42	Semi-Authoritarian Delegated Monarchy
43	De Facto Authoritarian Presidentialism
44	Illegitimate False Democratic Strong Monarchism
45	Semi-Democratic Parliamentary Military Regime
46	Illegitimate Dominating Semi-Authoritarian Regime
47	Constitutional Military Interim Regime
48	De Facto Authoritarian Semi-Presidentialism
49	Semi-Authoritarian Presidentialism
50	False Authoritarian Presidential Minority Government
51	Semi-Authoritarian Semi-Presidentialism
52	Semi-Authoritarian Presidential Parliamentarism
53	False Democratic Strong Monarchism
54	Illegitimate Hierarchical Parliamentarism
55	False Democratic Dominating Parliamentarism
56	Illegitimate False Democratic Monarchism
57	False Authoritarian Presidential Majority Government
58	Reformed Regime-Based Interim
59	Autonomous Colonialism
60	Hierarchical Democratic Presidentialism
61	Reconstructed Regime-Based Interim
62	Hierarchical Democratic Parliamentarism
63	False Democratic Strong Presidentialism
64	False Democratic Monarchism
65	Transitional Centralized Interim
66	Dominating Interim Presidentialism
67	Dominating Democratic Parliamentarism
68	False Democratic Presidentialism
69	False Democratic Semi-Presidentialism
70	False Democratic Strong Monarchical Parliamentarism
71	False Democratic Presidential-Parliamentarian
72	Transitional Interim Coalition
73	Constitutional Interim Coalition
74	Semi-Democratic Presidentialism
75	Strong Monarchial Parliamentarism
76	Interim Parliamentarism
77	Elected Interim Parliamentarian
78	False democratic Semi-Parliamentarism
79	Democratic Strong Presidentialism
80	Electoral democratic Presidentialism
81	Provisional Presidentialism
82	Electoral democratic Semi-Presidentialism
83	Democratic Monarchical Parliamentarism
84	Electoral Democratic Presidential Parliamentarism
85	Intermediate Elected Interim
86	Semi-Democratic Parliamentarism
87	Democratic Constitutional Executive

Regime Value	Corresponding regime type
88	Democratic Council Parliamentarian
89	Qualified Democratic Indirect Presidentialism
90	Extra-Parliamentarian Interim
91	Qualified Democratic Presidentialism
92	Qualified Democratic Accountable Presidentialism
93	Qualified Democratic Included Territory
94	Qualified Democratic Indirect Parliamentarian Presidentialism
95	Qualified Democratic Indirect Semi-Presidentialism
96	Qualified Democratic Parliamentarian Presidentialism
97	Qualified Democratic Semi-Presidentialism
98	Qualified Democratic Divided Executive
99	Qualified Democratic Presidential Parliamentarism
100	Qualified Democratic Parliamentarism

Appendix B. Persistence of the effect of ppi on rule of law

As noted in the text (and as suggested by a helpful reviewer), the influence of monetary policy may have been stronger at deeper lags than the one month shown in the baseline equation. Using the full model of Column 10 in Table 3, I continuously increased the lags of the PPI by one to test both the persistence of the effect and its statistical significance. As can be seen from the table below, changes in Poland's PPI in the interwar period has consistent and significant effects on the rule of law, peaking in months 4 through 6, and diminishing in effect thereafter. However, the significance of the effect remains until month 43, meaning that monetary policy shocks can persist for over three and a half years in this sample.

Lag	Coefficient	t-stat
1	−0.0002	4.48
2	−0.0002	5.32
3	−0.0002	6.12
4	−0.0004	8.11
5	−0.0004	8.41
6	−0.0004	8.20
7	−0.0003	6.58
8	−0.0002	5.34
9	−0.0002	4.42
10	−0.0001	3.80
11	−0.0001	3.20
12	−0.0001	2.76
13	−0.0001	2.33
14	−0.0001	2.66
15	−0.0001	2.43
16	−0.0001	2.43
17	−0.0001	2.43
18	−0.0001	2.55
19	−0.0001	2.83
20	−0.0001	3.02
21	−0.0001	2.85
22	−0.0001	3.53
23	−0.0001	3.77
24	−0.0001	4.16
25	−0.0001	4.67
26	−0.0001	5.32
27	−0.0001	6.16
28	−0.0001	7.35
29	−0.0001	8.87
30	−0.0001	8.78
31	−0.0001	8.06
32	−0.0001	7.15
33	−0.0001	6.34
34	−0.0001	5.71

Lag	Coefficient	t-stat
35	−0.0001	5.09
36	−0.0001	4.60
37	−0.0001	4.11
38	−0.0001	3.61
39	−0.0001	3.15
40	−0.0001	2.70
41	−0.0001	2.27
42	−0.00005	1.81
43	−0.00004	1.26

Appendix C. Sign-restricted VAR results

As noted in the main text, Uhlig (2005) lays out what has become the canonical approach towards understanding the relationship between monetary policy and various macroeconomic outcome variables. Starting from the assumption that most modeling regarding monetary policy tend to embody priors, with the effects already narrowed down by "a priori theorizing" (Uhlig 2005:384), Uhlig uses a Bayesian approach in a VAR framework to derive the impact of shocks with as little use of theorizing as possible *in reference to the variable of interest*. In practice, this means that the response of the outcome variable (in Uhlig's paper, output) is unrestricted (where the agnosticism comes in), but the shocks are sign-restricted to evaluate the response of the outcome to various shocks (where theory is introduced). As Uhlig (2005:384) notes, "one can think about the procedure as identifying all shocks which are consistent with these fairly weak a priori restrictions."

While such an approach may be inappropriate for the reasons mentioned in the main text, in the interest of advancing our knowledge in the use of VARs with institutional outcome variables, I perform two separate VAR examinations here under Uhlig's framework using rule of law rather than other macroeconomic indicators:

- A Bayesian "pure-sign-restricted VAR" similar to that of Uhlig (2005) and Scholl and Uhlig (2008); and
- A Bayesian "penalty function" VAR, as used by Uhlig (2005).

As with Uhlig, the VAR is structured without a constant or time trend, and follows the form:

$$Y_t = \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + \ldots + \beta_n Y_{t-n} + \delta_1 X_{t-1} + \ldots + \delta_n X_{t-n} + \mu_t, \ t = 1, \ldots, T. \tag{1}$$

Where Y is an $m \times 1$ matrix of the rule of law, X is a similar matrix of the particular proxy for monetary policy, and u is the one-step ahead prediction error. The impulse response vector a shows a response over the time horizon k as:
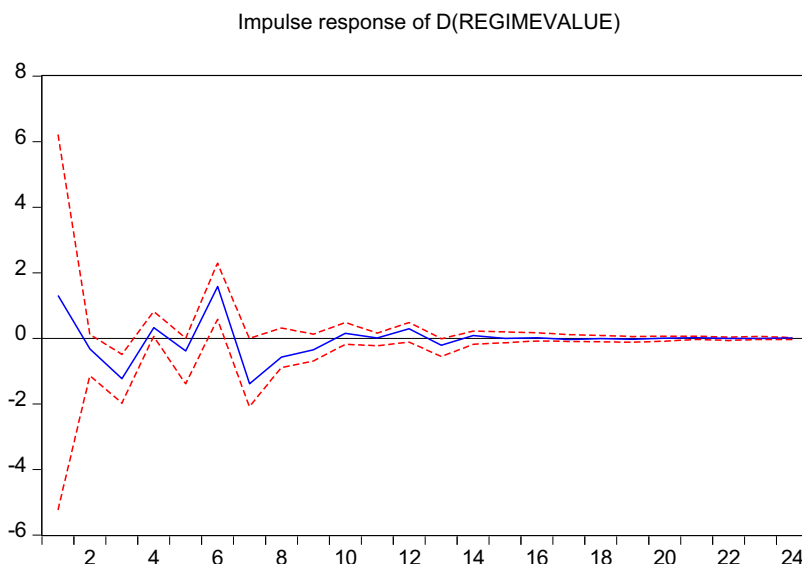
$$r_a(k) = \sum_{i=1}^{m} \alpha r_i(k) \tag{2}$$

Impulse response of D(REGIMEVALUE)

Fig. C1. Impulse response, regime value to PPI shock, 6 lags (pure sign-restriction).

Impulse response of D(REGIMEVALUE)
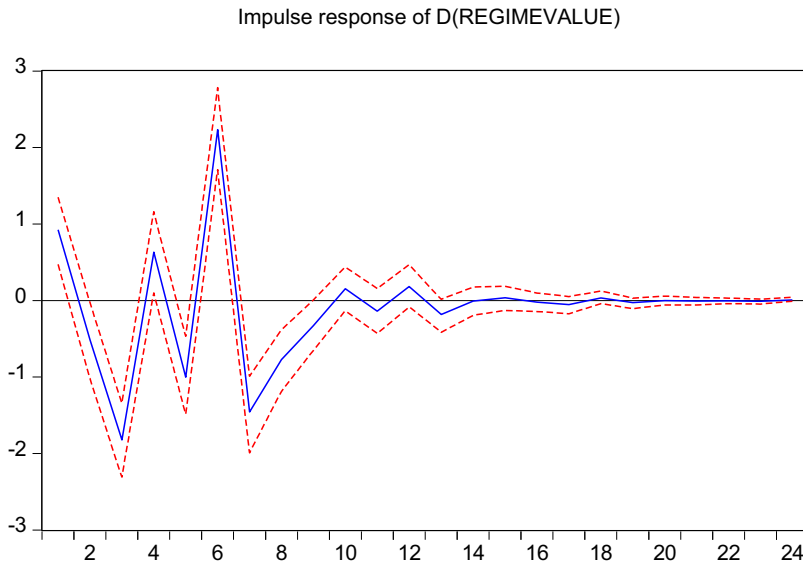
Fig. C2. Impulse response, regime value to PPI shock, 6 lags (penalty approach).

Fraction of variance explained for Regime Value by PPI
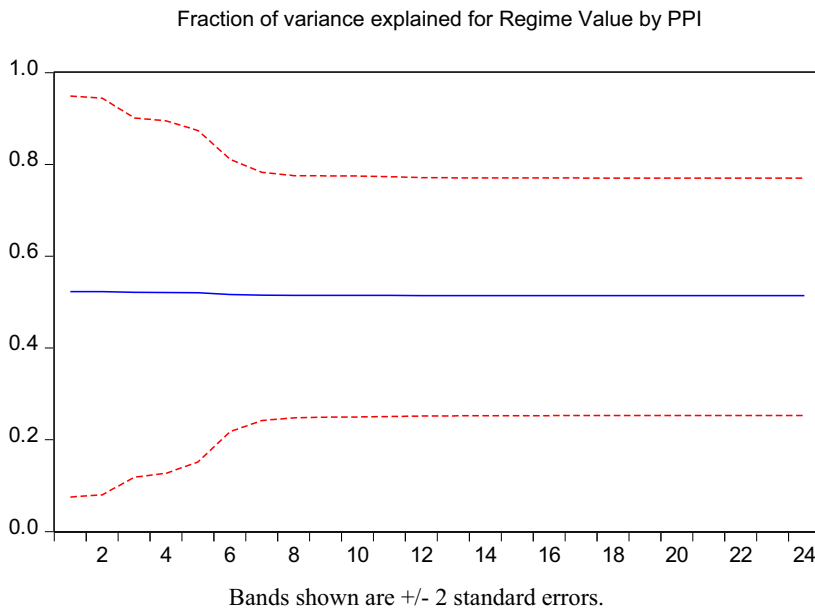

Bands shown are +/- 2 standard errors.

Fig. C3. Variance decomposition, 6 lags (pure sign-restriction), PPI shock.

The sign restriction enters in as an inequality on α, restricting it to half the space of the entire impulse vector. The implementation of this approach can be done in one of two ways. First, the pure sign-restriction approach relies on a Bayesian prior (an extended Normal–Wishart prior, as per Zellner (1971) and posterior to discard impulse responses which do not comport with the sign restriction over a predetermined set of draws. The second approach is by using a penalty function, which keeps all draws but assigns a penalty to those which violate the sign restriction and a reward to those which satisfy it. As Uhlig (2005:391) notes,

The penalty-function approach delivers impulse response functions with small standard errors as it seeks to go as far as possible in imposing certain sign restrictions. The penalty-function approach leaves the reduced-form VAR untouched, while the pure-sign-restriction is, in effect, simultaneously an estimation of the reduced-form VAR alongside the impulse vector: VAR parameter draws, which do not permit any impulse vector to satisfy the imposed sign restrictions, receive zero prior weight, and VAR parameter draws, which easily permit satisfaction of the sign restrictions, receive more weight.
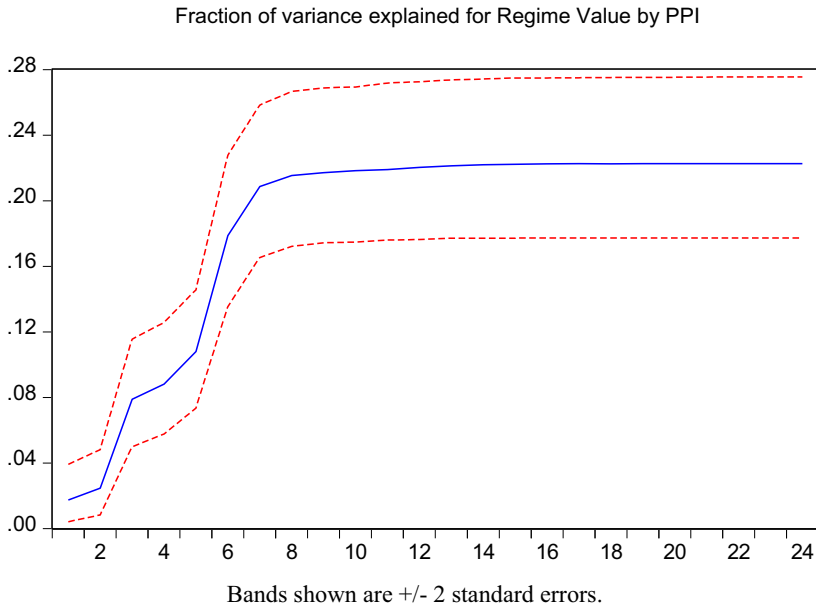
Fraction of variance explained for Regime Value by PPI

Bands shown are +/- 2 standard errors.

Fig. C4. Variance decomposition, 6 lags (penalty approach), PPI shock.

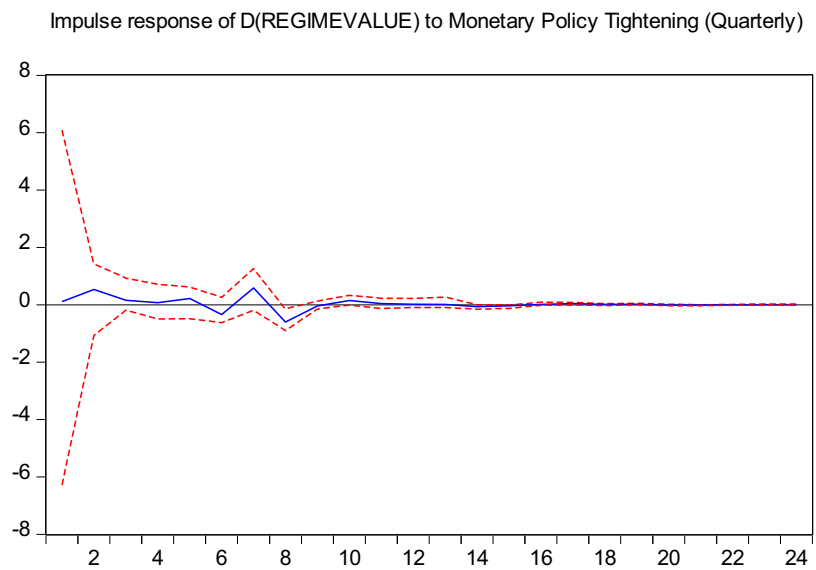Impulse response of D(REGIMEVALUE) to Monetary Policy Tightening (Quarterly)

Fig. C5. Impulse response, regime value to monetary policy (quarterly) shock, 6 lags (pure sign-restriction).

For this exercise, the number of draws has been set at 10,000. Finally, the lag length for this exercise is determined through minimization of the usual information criteria.

Using an agnostic approach, the results of the VAR tests are shown in Figs. C1–C4 for our main proxy for monetary policy, the (difference of the) PPI versus the (difference of the) rule of law variable. Using the Akaike, Schwarz, Hannan-Quinn criteria, as well as in the sequential modified LR test statistic and the final prediction error test, a lag length of 6 was used as optimal. In each case, the effect of a positive shock to Poland's PPI results in erratic effects on the rule of law, but with a mostly statistically insignificant effect (as evidenced by the large confidence bounds) apart from a negative effect in the third month following the shock (Fig. C1). The penalty approach (Fig. C2) appears to have tighter confidence bounds, suggesting an overall negative effect of monetary policy on rule of law during periods 1, 2, 3, 5, and 7, but even this effect is counterbalanced by significant *positive* effects in periods 4, 6, 8, and 9.
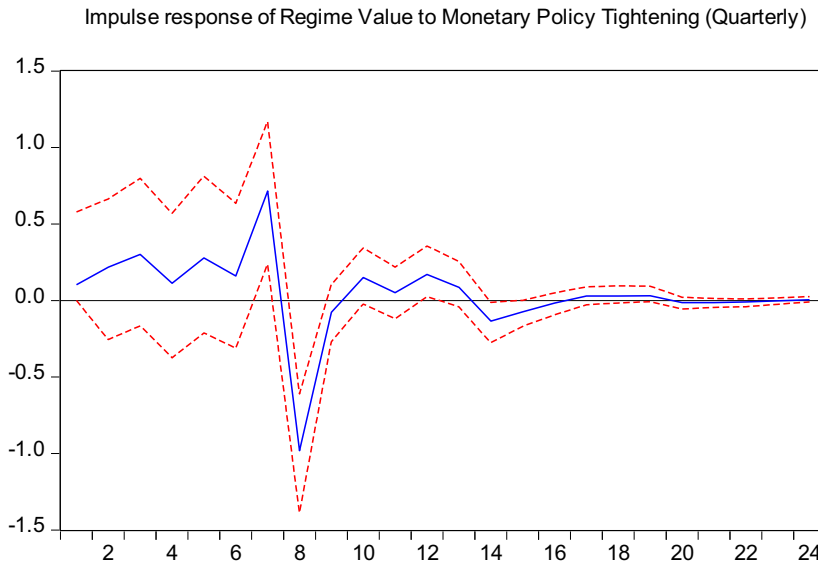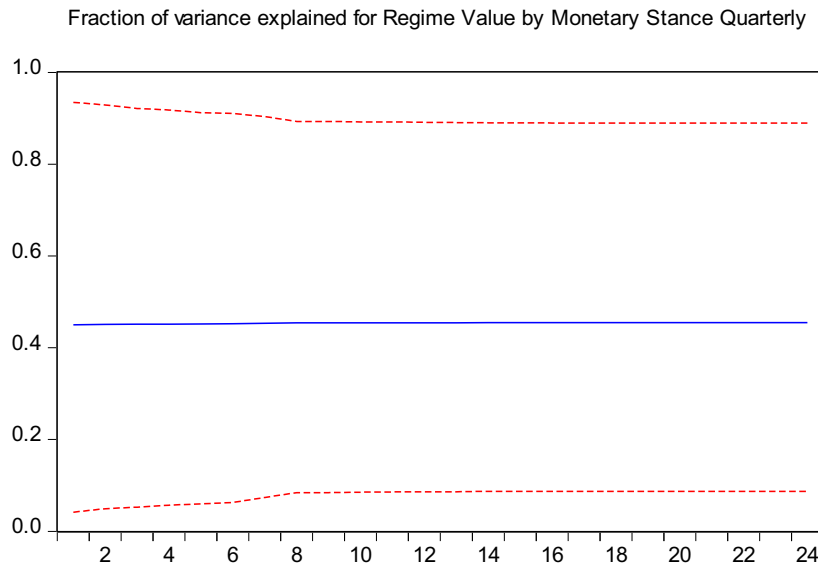
Impulse response of Regime Value to Monetary Policy Tightening (Quarterly)

Fig. C6. Impulse response, regime value to monetary policy (quarterly) shock, 6 lags (penalty approach).

Fraction of variance explained for Regime Value by Monetary Stance Quarterly

Bands shown are +/- 2 standard errors.

Fig. C7. Variance decomposition, 6 lags (pure sign-restriction), MP quarterly shock.

The variance decomposition between the two approaches also is highly variable depending upon the monetary shock, with Fig. C3 showing that the shock in the pure sign-restriction approach explains 51% of the variance, while in the penalty approach (Fig. C4), the effect reaches 22% at its highest.

As a monetary policy proxy, PPI works well for capturing the lag in monetary policy changes and how these shocks are actually transmitted through the economy. However, as noted in the text, we also have more immediate proxies for monetary policy changes—the dichotomous variable on monetary policy stance measured over the quarter. Bearing in mind that a positive shock to this variable would be a tightening of monetary policy, the results of the impulse responses for the monetary policy stance are shown in Fig. C5 (pure sign-restriction) and C6 (penalty approach). Much like the PPI variable, the monetary policy variable is erratic and entirely insignificant in the pure sign-restriction approach, while the penalty approach shows a significant positive response in period 7, a negative response in period 8, and a positive response again in period 12. Also similar to the PPI VARs, the variance decomposition varies widely depending upon the approach used, with the pure sign-restriction approach covering 45% of the variance in the rule of law variable, but the penalty approach only showing 5% of variance in rule of law due to monetary policy.
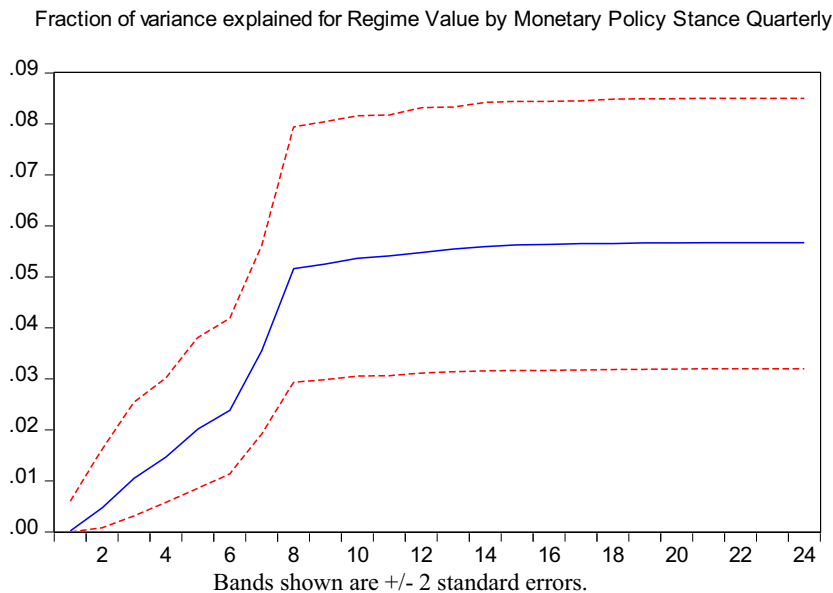
Fraction of variance explained for Regime Value by Monetary Policy Stance Quarterly

Bands shown are +/- 2 standard errors.

Fig. C8. Variance decomposition, 6 lags (penalty approach), MP quarterly shock.

The erratic nature of these results, coupled with the strong responses shown in the main text when a structural equation is used, lead to a preference for the structural modeling rather than a purely agnostic approach. Indeed, these results show the danger of modeling institutional effects using only prior information on a particular institution, especially one in an environment where the entire institutional system is changing; failing to take into account this institutional environment and operating without relevant economic theory about the drivers of a particular institution can lead to erroneous assumptions about dynamic relationships in the future.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.eeh.2018.03.001.

References

Acemoglu, D., Johnson, S., 2005. Unbundling Institutions. J. Political Econ. 113 (5), 949–995.
Acemoglu, D., Robinson, J.A., 2005. Economic Origins of Dictatorship and Democracy. Cambridge University Press, Cambridge.
Acemoglu, D., Johnson, S., Robinson, J.A., 2005. Institutions as a fundamental cause of long-run growth. In: Aghion, Durlauf, St. (Eds.), Handbook of Economic Growth. Elsevier, North Holland, pp. 385–472.
Álvarez, L.J., Burriel, P., Hernando, I., 2010. Price-setting behaviour in Spain: evidence from micro PPI data. Managerial Dec. Econ. 31 (2-3), 105–121.
Andrews, J.T., Montinola, G.R., 2004. Veto players and the rule of law in emerging democracies. Comp. Polit. Stud. 37 (1), 55–87.
Angrist, J.D., Pischke, J.S., 2008. Mostly Harmless Econometrics: An empiricist's Companion. Princeton University Press, Princeton, NJ.
Arestis, P., Bain, K., 1995. The independence of central banks: a nonconventional perspective. J. Econ. Issues 29 (1), 161–174.
Argitis, G., Pitelis, C., 2001. Monetary policy and the distribution of income: Evidence for the United States and the United Kingdom. J. Post Keynesian Econ. 23 (4), 617–638.
Barro, R.J., 1999. Determinants of Democracy. J. Political Econ. 107 (S6), S158–S183.
Berkowitz, D., DeJong, D.N., 2005. Entrepreneurship and post-socialist growth. Oxford Bull. Econ. Stat. 67 (1), 25–46.
Berkowitz, D., Pistor, K., Richard, J.F., 2003. Economic development, legality, and the transplant effect. Eur. Econ. Rev. 47 (1), 165–195.
Bernanke, B.S., Mihov, I., 1998. Measuring monetary policy. Q. J. Econ. 113 (3), 869–902.
Besley, T., Persson, T., Reynal-Querol, M., 2016. Resilient leaders and institutional reform: theory and evidence. Economica 83 (332), 584–623.
Blinkhorn, M., 2014. Fascism and The Right in Europe 1919-1945. Routledge, New York.
Brecke, P., 1999. Violent conflicts 1400 A.D. to the present in different regions of the world. In: Proceedings of the the 1999 Meeting of the Peace Science Society in Ann Arbor, Michigan.
Buczkowski, T.J., 1927. Statut Banku Polskiego. Ruch Prawniczy, Ekonomiczny i Socjologiczny 7 (3), 149–160.
Bulte, E., Damania, R., 2008. Resources for sale: corruption, democracy and the natural resource curse. BE J. Econ. Anal. Policy 8 (1).
Calderón, C., Duncan, R., Schmidt-Hebbel, K., 2016. Do good institutions promote countercyclical macroeconomic policies. Oxford Bull. Econ. Stat. 78 (5), 650–670.
Canova, T.A., 2009. Financial market failure as a crisis in the rule of law: from market fundamentalism to a new Keynesian regulatory model. Harvard Law Policy Rev. 3 (2), 369–396.
Collier, P., 1999. On the economic consequences of civil war. Oxford Econ. Papers 51 (1), 168–183.
Conover, C.M., Jensen, G.R., Johnson, R.R., 1999. Monetary environments and international stock returns. J. Banking Finance 23 (9), 1357–1381.
Consolo, A., Favero, C.A., 2009. Monetary policy inertia: More a fiction than a fact. J. Monetary Econ. 56 (6), 900–906.
Corrsin, S.D., 1998. Literacy rates and questions of language, faith and ethnic identity in population censuses in the partitioned polish lands and interwar Poland (1880s-1930 s). Polish Rev. 43 (2), 131–160.
Csordás, S., Ludwig, M., 2011. An empirical investigation of the determinants of democracy: Trade, aid and the neighbor effect. Econ. Lett. 110 (3), 235–237.
Cukierman, A., Webb, S., Neyapti, B., 1992. Measuring the independence of central banks and its effect on policy outcomes. World Bank Econ. Rev. 6 (3), 353–398.
Czarnitzki, D., Kraft, K., 2009. Capital control, debt financing and innovative activity. J. Econ. Behav. Organ. 71 (2), 372–383.

Drecki, J., 1929. Bezrobocie w Polsce Niepodległej (Unemployment after Poland's Independence). In: Zaleski, S., Schramm, W., Taylor, E. (Eds.). In: Bilans Gospodarczy Dziesięciolecia Polski Odrodzonej (Economics On Balance in the Reborn Poland), 2. Gebethner and Wolff, Poznań, pp. 371–382.

Dube, O., Vargas, J.F., 2013. Commodity price shocks and civil conflict: Evidence from Colombia. Rev. Econ. Stud. 80 (4), 1384–1421.

Eijffinger, S., & Stadhouders, P. (2003). *Monetary Policy and the Rule of Law*. CEPR Discussion Papers No. 3698.

Erdogdu, E., 2013. A cross-country analysis of electricity market reforms: potential contribution of new institutional economics. Energy Econ. 39, 239–251.

Fatás, A., Mihov, I., 2013. Policy volatility, institutions, and economic growth. Rev. Econ. Stat. 95 (2), 362–376.

Feinberg, R., 1986. The interaction of foreign exchange and market power effects on german domestic prices. J. Ind. Econ. 35 (1), 61–70.

Flachaire, E., García-Peñalosa, C., Konte, M., 2014. Political versus economic institutions in the growth process. J. Comp. Econ. 42 (1), 212–229.

Francis, N., Ramey, V.A., 2009. Measures of per capita hours and their implications for the technology-hours debate. J. Money, Credit Bank. 41 (6), 1071–1097.

Gerlach, S., Peng, W., 2005. Bank lending and property prices in Hong Kong. J. Bank. Finance 29 (2), 461–481.

Góes, C., 2016. Institutions and growth: a GMM/IV panel VAR approach. Econ. Lett. 138, 85–91.

Gourieroux, C., Monfort, A., Trognon, A., 1984. Pseudo maximum likelihood methods: applications to poisson models. Econometrica 52 (3), 701–720.

Granger, C.W., Jeon, Y., 2003. Interactions between large macro models and time series analysis. Int. J. Finance Econ. 8 (1), 1–10.

Haczyński, L.J., 1975. Review of wynot, polish politics in transition: the camp of national unity and the struggle for power 1935-1939. Can. J. History 10 (2), 278–280.

Hanke, S., 2003. Money and the Rule of Law in Ecuador. Policy Reform 6 (3), 131–145.

Hartwell, C.A., 2013. Institutional Barriers in the Transition to Market: Examining Performance and Divergence in Transition Economies. Palgrave Macmillan, Basingstoke.

Hartwell, C.A., 2016. Two Roads Diverge: The Transition Experience of Poland and Ukraine. Cambridge University Press, Cambridge.

Hayo, B., Hofmann, B., 2006. Comparing monetary policy reaction functions: ECB versus Bundesbank. Emp. Econ. 31 (3), 645–662.

Henderson, J.V., & Kuncoro, A. (2004). Corruption in Indonesia (No. w10674). National Bureau of Economic Research.

Hendry, D.F., 2000. Econometrics: Alchemy or Science? Oxford University Press, Oxford.

Hill, L.E., Butler, C.E., Lorenzen, S.A., 1977. Inflation and the destruction of democracy: the case of the weimar republic. J. Econ. Issues 11 (2), 299–313.

Hirschman, A.O., 1978. Exit, voice, and the state. World Politics 31 (1), 90–107.

Hoff, K., Stiglitz, J.E., 2004. After the big bang? Obstacles to the emergence of the rule of law in post-communist societies. Am. Econ. Rev. 94 (3), 753–763.

Kalyuzhnova, Y., Kutan, A.M., Yigit, T., 2009. Corruption and economic development in energy-rich economies. Comp. Econ. Stud. 51 (2), 165–180.

Karakas, L.D., 2016. Political turnover and the accumulation of democratic capital. Eur. J. Political Econ. 44, 195–213.

Koppl, R., 2006. Austrian economics at the cutting edge. Rev. Aust. Econ. 19 (4), 231–241.

Koustas, Z., Lamarche, J.F., 2012. Instrumental variable estimation of a nonlinear Taylor rule. Emp. Econ. 42 (1), 1–20.

Kowalski, G.M., 2014. The Amendment of August 1926 to the first Polish Constitution of the Second Republic. Krakowskie Studia z Historii Państwa i Prawa 7 (2), 317–322.

Koyama, M., Johnson, B., 2015. Monetary stability and the rule of law. J. Financial Stab. 17, 46–58.

Krause, G.A., 1996. The institutional dynamics of policy administration: Bureaucratic influence over securities regulation. Am. J. Political Sci. 1083–1121.

Krone, R., 2014. Political and social determinants of rule and un-rule of law in Latin America. In: Proceedings of the Association for Public Policy and Management (APPAM) Conference. Albuquerque, New Mexico November 6. https://appam.confex.com/appam/2014/webprogram/Paper10349.html.

Kydland, F., Prescott, E., 1977. Rules rather than discretion: the inconsistency of optimal plans. J. Political Econ. 85 (3), 473–490.

Landau, Z., 1990. Integracja Gospodarcza Polski w Latach 1918-1923 [Polish Economic Integration in the Years 1918-1923]. Studia Historyczne 33 (1), 63–76.

Landau, Z., Tomaszewski, J., 1984. Poland between inflation and stabilization 1924-1927. In: Feldmann, G.D., Holtfrerich, C-L., Ritter, G.A., Witt, P.C. (Eds.), Die Erfahrung der Inflation im Internationalen Zusammenhang Und Vergleich. de Gruyter, Berlin, pp. 270–294.

Landgrave, M., & Nowrasteh, A. (2016). Voice, Exit, and Liberty: The Effect of Emigration on Origin Country Institutions. Cato Institute Economic Development Bulletin no. 25, May 26.

Lawson, C., Wang, H., 2005. Economic Transition in Central and Eastern Europe and the Former Soviet Union: Which Policies Worked? Centre for Public Economics at the University of Bath Working Paper No. 01-05.

Lerski, J.J., 1996. Historical Dictionary of Poland, 966-1945. Greenwood Publishing, Westport, CT.

Mishkin, F.S., 1999. International experiences with different monetary policy regimes. J. Monetary Econ. 43 (3), 579–605.

Møller, J., Skaaning, S.E., 2014. Explaining cross-national differences in adherence to the rule of law. In: Møller, J., Skaaning, S.E. (Eds.), The Rule of Law: Definitions, Measures, Patterns and Causes. Palgrave Macmillan, Basingstoke, pp. 149–172.

Morawski, W., 2008. Od Marki Do złotego. Historia finansów Drugiej rzeczypospolitej [From Mark to Złoty: The History of Finance in the Second Republic]. Wydawnictwo Naukowe PWN, Warsaw.

Mullahy, J., 1997. Instrumental-variable estimation of count data models: Applications to models of cigarette smoking behavior. The Rev. Econ. Stat. 79 (4), 586–593.

Muller, E.N., 1995. Economic determinants of democracy. Am. Sociol. Rev. 60 (6), 966–982.

Norman, C.S., 2009. Rule of law and the resource curse: abundance versus intensity. Environ. Res. Econ. 43 (2), 183–207.

North, D.C., 1984. Government and the cost of exchange in history. J. Econ. History 44 (02), 255–264.

Pahre, R., 2001. Most-favored-nation clauses and clustered negotiations. Int. Organ. 55 (4), 859–890.

Przeworski, A., Limongi, F., 1993. Political regimes and economic growth. J. Econ. Perspect. 7 (3), 51–69.

Rånge, M., Sandberg, M., 2017. Political Institutions and regimes since 1600: A new historical data set. J. Interdiscipl. History 47 (4), 495–520.

Ravn, M.O., Uhlig, H., 2002. On adjusting the Hodrick-Prescott filter for the frequency of observations. Rev. Econ. Stat. 84 (2), 371–376.

Robinson, K.L., 1979. The distributional consequences of inflation. Am. J. Agri. Econ. 61 (5), 903–908.

Sargent, T.J., 1982. The ends of four big inflations. In: Hall, R.E. (Ed.), Inflation: Causes and Effects. University of Chicago Press, Chicago, pp. 41–98.

Saxegaard, M., 2006. Excess Liquidity and Effectiveness of Monetary Policy; Evidence from Sub-Saharan Africa. International Monetary Fund Working Paper No. 06/115.

Scholl, A., Uhlig, H., 2008. New evidence on the puzzles: Results from agnostic identification on monetary policy and exchange rates. J. Int. Econ. 76 (1), 1–13.

Skaaning, S.E., 2010. Measuring the rule of law. Political Res. Q. 63 (2), 449–460.

Sims, C.A., 1980. Macroeconomics and Reality. Econometrica 48 (1), 1–48.

Tabellini, G., 2010. Culture and institutions: economic development in the regions of Europe. J. Eur. Econ. Assoc. 8 (4), 677–716.

Taylor, E., 1926. Druga Inflacja Polska. Przyczyny - przebieg - środki zaradcze [The Second Inflation in Poland. Causes – Course – Remedies]. Gebethner i Wolff, Poznań.

Tsebelis, G., 1995. Decision making in political systems: Veto players in presidentialism, parliamentarism, multicameralism and multipartyism. British J. Political Sci. 25 (3), 289–325.

Uhlig, H., 2005. What are the effects of monetary policy on output? Results from an agnostic identification procedure. J. Monet. Econ. 52 (2), 381–419.

Van Riel, A., Schram, A., 1993. Weimar economic decline, Nazi economic recovery, and the stabilization of political dictatorship. J. Econ. History 53 (1), 71–105.

Vašíček, B., 2010. Monetary policy rules and inflation processes in open emerging economies: evidence from twelve new EU members. Eastern Eur. Econ. 48 (4), 36–58.

Vézina, P.L., 2012. How migrant networks facilitate trade: Evidence from Swiss exports. Swiss J. Econ. Stat. 148 (III), 449–476.

von Thadden, G.H., 1995. Inflation in the reconstruction of Poland 1918-1927 (PhD thesis). London School of Economics and Political Science, (United Kingdom).

Wells, J., Wills, D., 2000. Revolution, restoration, and debt repudiation: the Jacobite threat to England's institutions and economic growth. J. Econ. Hist. 60 (2), 418–441.

White, L.H., 2010. The rule of law or the rule of central bankers. Cato J. 30 (3), 451–463.

White, M.V., Schuler, K., 2009. Retrospectives: who said "debauch the currency": Keynes or Lenin? J. Econ. Persp. 23 (2), 213–222.

Williams, T.M., 1984. Stock control with sporadic and slow-moving demand. J. Oper. Res. Soc. 35 (10), 939–948.

Windmeijer, F.A.G., Santos Silva, J., 1997. Endogeneity in count data models: an application to demand for health care. J. Appl. Econ. 12 (3), 281–294.

Wolf, N., 2005. Path dependent border effects: the case of Poland's reunification (1918-1939). Explor. Econ. Hist. 42 (3), 414–438.

Wolf, N., 2007. Should I stay or should I go? Understanding Poland's adherence to gold, 1928-1936. Hist. Social Res./Historische Sozialforschung 32 (4), 351–368.

Wolf, N., 2008. Scylla and Charybdis. explaining Europe's exit from gold, January 1928-December 1936. Explor. Econ. Hist. 45 (4), 383–401.

Wooldridge, J.M., 1997. Quasi-likelihood Methods for Count Data. In: Pesaran, M.H., Schmidt, P. (Eds.). In: Handbook of Applied Econometrics, 2. Blackwell, Oxford, pp. 352–406.

Woolley, J.T., 1985. Monetary Politics: The Federal Reserve and the Politics of Monetary Policy. Cambridge University Press, Cambridge.

Zdziechowski, J., 1925. Finanse Polski w latach 1924 i 1925 [Polish Finance in the Years 1924 and 1925]. Instytut Wydawniczy "Bibljoteka polska", Warsaw.

Zellner, A., 1971. An Introduction to Bayesian Inference in Econometrics. Wiley Books, New York.