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**HYPERINFLATION IN THE ŁÓDŹ
GHETTO**

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Abstract

This paper fits into a hyperinflation research program developed by Hanke. It started with the measurement of Yugoslavia's hyperinflation in 1994 (Hanke, 1999). This was followed by the measurement of Zimbabwe's hyperinflation in 2007-2008 (Hanke-Kwok, 2008). Then, the Hanke-Krus World Hyperinflation Table, in which 56 episodes of hyperinflation were identified, was developed. Since then, six additional episodes have been identified.

With this paper, we add yet another episode of hyperinflation — the 63rd. The Nazis forced the Jews of the Łódź Ghetto to use a scrip in an effort to dispossess the prisoners of their valuables, hard currencies, and to further isolate them. Ghetto inhabitants used this currency—the “Łódź Ghetto Mark”—in intra-ghetto, black market trading. Ghetto diaries and chronicles were used to compile an extensive record of black-market exchange-rate and trading data. These data were used to calculate the inflation rates that were experienced at the Łódź Ghetto from January 1941

through July 1944. The Łódź Ghetto episode of hyperinflation occurred in March 1942, when the monthly inflation rate hit 232.42%. This constitutes the world's 63rd hyperinflation episode.

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I. Introduction

The Łódź Ghetto— Background

World War Two began when German tanks rolled into Poland on September 1, 1939. A week later the Nazis occupied the city of Łódź in the country's center. Hitler decided to annex Łódź and renamed it Litzmannstadt. 233,000 Jews lived in the city—a third of the population—and their presence posed a problem for the Germans seeking to create a *judenrein* zone. Immediately, the Germans authorized anti-Jewish decrees. Jews were forced to wear a yellow star on the chest and back; they were prohibited from leaving their homes in the afternoon, barred from traveling on the main thoroughfare, and from using public transportation. Economic repression dispossessed Jews of their property and means of earning a living.

By the time the Nazis began secretly planning a ghetto in December 1939, Jews were fleeing Łódź in droves and 30 percent had left by May. On February 8th, 1940, SS Brigadeführer Johannes Schäfer issued an order confining Jews to a list of streets they could reside. Construction of a wooden and barbed wire fence surrounding those streets was completed in April, and on May 10th, Schäfer announced that “any attempt by a ghetto resident to leave the ghetto” would be punished with death. Two units of German police guarded the perimeter, and just like that, 164,000 were trapped. So tight and total was the sealing of the Łódź Ghetto that historians consider it the most impenetrable and isolated of all Nazi ghettos. There were only two ways out: in a casket or a cattle car.

The Łódź Ghetto— Structure and Administration

For practical and ideological reasons, the Germans didn't want to directly manage the affairs of the ghetto. This task was delegated to a new council of Jews—appointed and directed by, and accountable to, the Nazis—called the *Judenrat*. This body operated nearly three dozen bureaucratic offices with varying degrees of autonomy, divided into seven groups: General Administration, Supply Branches, Economic-Financial Branch, Purchasing, Ghetto Industry, School and Health Institutions, Social Welfare. There was a Jewish police force, post office, taxes agency, treasury, archive, orphanage, official rabbinate, judiciary, prison, and even an animal husbandry department—the trappings of an overbearing state commanding a ubiquitous presence.

At the helm of the *Judenrat* was the “Eldest of the Jews”, whom the Nazis tasked with “carry[ing] out all the measures of the German civil administration in regard to all persons belonging to the Jewish race.”¹ The man chosen, Chaim Mordechai Rumkowski, embraced the centralization of ghetto administration in his hands. His governing philosophy was “work protects us from annihilation,” believing that if ghetto productive output was vital to the German war effort, the Jewish inhabitants would be spared from the worst of Nazi aggression. By the end of 1943, the 117 factories, workshops, sorting sites, and warehouses employed 73,782 forced-laborers, which amounted to over 85 percent of the ghetto population.² Rumkowski prepared lists of those unable to work and work efficiently; almost all of the listed were deported to death camps.³

The ruthless strategy led to the Łódź Ghetto remaining open until the end of August 1944, a year longer than nearly all the other ghettos in Eastern Europe.

The Łódź GhettoMark — the ‘Local’ Currency

The mayor of Litzmannstadt, Karl Marder, sought to extract vast quantities of capital from the ghetto. One promising source was hard currency. He estimated that the Jews were harboring some five million German reichsmarks.⁴ The medium used to effectuate this exploitation was an internal ghetto currency—the “Ghetto Mark” or ghettomark—introduced on May 15th, 1940 as the sole legal tender inside the newly sealed ghetto walls. The *Judenrat*-run Ghetto Issuing Bank was given a fair degree of autonomy in controlling the currency’s minting, supply, and official rates of exchange for German/foreign currency and ghetto notes.⁵ The Germans also saw value in the ghettomark as a tool to further isolate the Jews from the outside world.⁶

The Nazis severely punished unlawful possession of “foreign” money.⁷ Residents were ordered to exchange their outside currencies and certain valuables to the Bank for Purchase of

¹ Trunk, Isaiah. *Łódź Ghetto: a History*. Edited by Robert Moses Shapiro, Indiana University Press, 2008, p. 33.

² *Id.*, p. 53.

³ *Ibid.*

⁴ Horwitz, Gordon J. *Ghettostadt: Łódź and the Making of a Nazi City*. Belknap, 2010, p. 63.

⁵ “The Łódź Ghetto 1940 - 1944.” *Holocaust Research Project*, www.holocaustresearchproject.org/ghettos/Łódź/Łódźghetto.html.

⁶ Sitarek, Adam, and Katarzyna Gucio. *Wire Bound State: Structure and Functions of the Jewish Administration of the Łódź Ghetto*. Institute of National Remembrance, Commission for the Prosecution of Crimes against the Polish Nation, 2018, p. 113.

⁷ Dobroszycki, Lucjan. *The Chronicle of the Łódź Ghetto 1941-1944*. Yale University Press, 1984, p. 71 (listing unlawful currency possession alongside “murder and the spreading of information that could be

Valuable Objects and Clothing, which also served as a buyer of last resort to “voluntary” sellers.⁸ This Jewish bank then sold the property to the Nazis (priced much below market value), the proceeds from which were placed in a special account assigned for food supplies for the ghetto. Balance sheets from ghetto departments show złoty reserves with which the *Judenrat* sought to back its spending and purchase necessities from the Germans.⁹ The Łódź Ghetto was the first ghetto to create a currency, which it minted in paper form and was the only ghetto to strike coins (see Charts VII and VIII in the Appendix).

The Black Market

To survive on official rations alone was difficult. As historian Isaiah Trunk explained, “the products from the official food allocation for the non-working population in the Lodz Ghetto covered only between 46 and 58 percent of the minimal caloric need that is necessary to keep the organism alive (2,400 calories), while for a working person it was about 66 percent of the minimum required (3,000 calories). In such a nutritional situation, combined with difficult physical labor, the organism could not survive longer than six to eight months.... [and] the food supply situation in the Lodz Ghetto was actually even worse.”¹⁰ The supply of medicine, clothing, heating, and other necessities was similarly not suited to sustain human life. Other supply sources were minimal. Smuggling—the lifeblood of other ghettos—was rooted out completely by the Germans and Rumkowski. As the *Holocaust Encyclopedia* explains: “[t]he Lodz Ghetto was [the] only ghetto where smuggling was absolutely impossible.”¹¹ Jewish production for internal consumption did occur, adding to the supply of goods in the ghetto. For example, some lands towards the outskirts of the ghetto were used for food cultivation, many planted vegetables in their windowsills or gardens,¹² and fruit trees were “put in good order.”¹³ This supply fluctuated (typically

injurious to the Reich...[crimes that t]he [Jewish] court would be authorized to administer every degree of punishment including the death sentence”).

⁸ Horwitz, op. cit., p. 71.

⁹ Trunk, op. cit., p. 81. It’s worth noting that the złoty experienced high inflation and two hyperinflations during the ghetto’s existence, which must’ve added strain to the ghetto’s ability to secure supplies from the Nazis and stabilize the ghettomark. See Hanke, Steve H., et al. “Hyperinflation in the General Government: German-Occupied Poland During World War II.” *World Economics Journal*, vol. 21, no. 2, June 2020.

¹⁰ Trunk, op. cit., p. 117.

¹¹ Laqueur, Walter, and Judith Tydor Baumel. *The Holocaust Encyclopedia*. Yale University Press, 2001, p. 260.

¹² Dobroszycki, op. cit., p. 492.

¹³ *Id.*, p. 304.

downward) in reliability, though like beets in 1943 and onions in 1944, it could add a much-needed stock of goods to the black market and affect prices. Still, space, time, and resources (like seeds) were limited, and the home-grown produce was of lower quality. The goods that circulated on the black market, therefore, mostly “came from people compelled by various, often tragic reasons, to sell a portion of their food rations to buyers and speculators.”¹⁴

As we’ll see with the price data, buying on the black market was inaccessible to most of the ghetto population, in contrast to the wealthier ghetto elite (“getokratye”) tied to Rumkowski’s clique. “A highly qualified worker in the Łódź Ghetto initially earned on average about 20 marks, and later, in 1943,... 50 marks a month[.]”¹⁵ Less-skilled workers and the unemployed received even less. The overwhelming majority of the populace was wholly dependent on that salary, and thus had virtually no chance to buy most black-market items. For example, a kilogram of open-market bread reached 1,200 marks, and a kilogram of butter once demanded 2,000 marks. “It is clear why a Jew in the Łódź Ghetto was entirely dependent on the official food supply. Rumkowski applied the German policy of ‘freezing’ the prewar wages and salaries, so that a ghetto worker ought not to earn more than enough to purchase food rations for himself and his family.”¹⁶ “The result[.]” Trunk concludes, “could only be a slow death from starvation.”¹⁷

Determined to prolong their lives, however, prisoners naturally turned to private commerce *within* the ghetto, *between* ghetto inhabitants, trading and bartering anything they possessed or got their hands on—saving what they could—including medicine, food, fuel, furniture, utensils “clothing, shoes, linens, cosmetics, travel accessories, etc., etc.”¹⁸ But, as ghetto resident Oskar Rosenfeld remarked, “the Eldest of the Jews has repeatedly outlawed such trade, often shutting down the black-market stores and threatening proprietors with Czarniecki [Prison.]”¹⁹ And on one day in May 1942, he jailed twenty-four barterers to assert his dominance over free trade.²⁰ “The Female Order [police] Service[.]” another source recalls, “was also responsible for preventing minors from working as street traders.”²¹ “Sometimes[.]” Rosenfeld added, “the Kripo [German

¹⁴ Trunk, *op. cit.*, p. 117-118.

¹⁵ *Id.*, p. 118.

¹⁶ *Ibid.*

¹⁷ *Ibid.*

¹⁸ *Id.*, p. 143.

¹⁹ Dobroszycki, *op. cit.*, p. 487.

²⁰ Trunk, *op. cit.*, p. 143.

²¹ Sitarek, Adam, and Ewa Wiatr. *Encyclopedia of the Ghetto: The Unfinished Project of the Łódź Ghetto Archivists*. The State Archive in Łódź, 2016, p. 38.

police] would also visit the black-marketeers, and either impose large fines...or take valuable drugs and medications.”²² Black marketeers were singled out for deportation: “I have chosen that section for deportations,” Rumkowski thundered in January 1942, “that has been a festering boil for the ghetto. Thus, on the lists of the exiles, there were representatives of the underworld, scum and all individuals harmful for the ghetto. [...] When today I am sending away crooks and swindlers of all kinds from the ghetto, I am doing so convinced that those people are fully deserving of that fate.”²³ Rumkowski believed strongly that all points of distribution and sale—all transactions—must be under the auspices of his centralized bureau. “Dictatorship[,]” he argued, “is not a dirty word.”²⁴

The Black Market for Currency

A vibrant black market currency exchange persisted despite the harsh penalties associated with unlawfully owning foreign money. The underground *Ghetto Chronicle* noted “the appearance of German marks in circulation, which... had been used specifically for hard currency speculation.”²⁵ Czech kronen, Polish złoty, U.S. dollars, and other currencies circulated in underground trading.²⁶ A ghettomark counterfeiter was caught in November 1941 and admitted to the authorities that he planned “to exchange his counterfeit [ghetto] bills, primarily for German marks.”²⁷ So extensive was the illegal currency market that Nazi officials called a meeting with Jewish ghetto leaders to discuss, among other serious matters, “crimes connected with foreign currencies.”²⁸ Rumkowski gave a public address denouncing the money trade, saying “[p]lease remember, in the ghetto German marks are a foreign currency. They need to be exchanged at the Central Cash Desk for the local currency.”²⁹ That didn’t work. *Sondercommando* ordered to search ghetto residences in April 1941 were ordered to be on the lookout for “hard currencies, including German marks.”³⁰

²² *Ibid.*

²³ *Id.*, p. 214.

²⁴ Tiedens, Larissa Z. “Optimism and Revolt of the Oppressed: A Comparison of Two Polish Jewish Ghettos of World War II.” *Political Psychology*, vol. 18, no. 1, 1997, p. 60. *JSTOR*, <http://www.jstor.org/stable/3791983>.

²⁵ Dobroszycki, op. cit., p. 39.

²⁶ See, e.g., Rosenfeld, Oskar. *In the Beginning Was the Ghetto: Notebooks from Łódź*. Northwestern University Press, 2012, p. 169 (noting the presence of Czech “Crowns”).

²⁷ Dobroszycki, op. cit., p.83.

²⁸ *Id.*, p. 71.

²⁹ Sitarek and Gucio, op. cit., pp. 210–211.

³⁰ Dobroszycki, op. cit., p. 43.

Foreign currencies were sought after on the black market for various reasons: to bribe Nazis, to attempt to escape or smuggle, and to acquire purchasing power upon leaving the ghetto.³¹ For the latter, ghetto inmates, often blind to the fatal consequences of deportation, believed their Nazi captors that they were being resettled in the East. In the East, the ghettomark would be worthless so they exchanged it in sanguine anticipation of starting afresh.³² In fact, the only period for which consistent black market currency exchange data is available was from the currency trading frenzy of the first 5 months of 1942, during which there were some of the largest population movements in and out of the ghetto. Noticing this increased currency exchange activity, the *Chronicle* mentioned in early May 1942 that “[t]here continues to be a great rush in furtive transactions for the German mark.”³³

In the face of all the risks, the black market—currency or otherwise—remained a fixture of life in the Łódź Ghetto. Rosenfeld noticed that even though “[t]he shopkeeper would be ruined” by official efforts to destroy the black market, “he would be back on his feet soon enough.”³⁴ “The shops are closed down and then reopen despite the danger.”³⁵ “The ghetto police[,]” Trunk writes, “made confiscations and carried out arrests among the trading partners. But all this could not halt the trade that grew out of objective ghetto conditions.”³⁶ Rumkowski battled against the black market to, as he put it, “prevent price increases...[and] foods at inflated prices.”³⁷ His efforts failed. Ghetto prices increased with dizzying magnitude and speed. We turn now to these prices.

II. Calculations

Prices

³¹ See e.g., Rosenfeld, op. cit., p. 246 (describing a scene on the black market when “[a]n old woman is ordered to report to the Kripo [Nazi Police].” A neighbor advised her to “buy some reichsmarks and give them to the Kripo so they won’t beat you.’ Woman buys reichsmarks, goes to Kripo” and “[t]he woman gives the reichsmark to them.”).

³² See e.g., Dobroszycki, op. cit., p. 128 (observing the anticipation among soon-to-be-resettled ghetto inmates regarding their destination and which currencies will be valid in their new resettled locality. “[T]here was a rumor in the ghetto to the effect that in February [1942] people were being deported to the [Polish] Generalgouvernement where, as is known, German marks are not the currency in circulation.”).

³³ Trunk, op. cit., p. 143.

³⁴ *Id.*, p. 487.

³⁵ *Ibid.*

³⁶ Trunk, op. cit., p. 122.

³⁷ Sitarek and Gucio, op. cit. p. 98 n.76.

The authors compiled an extensive collection of black market prices in the Łódź Ghetto, ranging from personal diaries to collaborative publications. The bulk of the data came from the Polish edition of *Kronika Getta Łódzkiego*, known in English as *The Chronicle of the Łódź Ghetto*, a work written by ten to fifteen ghetto archivists employed by the *Judenrat* and dedicated to detailing ghetto life for posterity. We also found useful price data in the diary of Oskar Rosenfeld, and occasionally in the primary sources included in Adelson and Lapides' *Łódź Ghetto: Inside a Community Under Siege*, and Trunk's previously cited history of the Łódź Ghetto. Our data set contains consistent black market price points from January 1941 (the first month with extant black market price data) through July 1944 (the last full month of the ghetto's existence, before its liquidation in August 1944).

Price fluctuations were dramatic in the Łódź Ghetto. Rampant supply shortages, chronic instability, currency failures, and an increasingly desperate populace contributed to the general, upward price trend during the ghetto's existence. With starvation and disease rampant, getting a good price on the black market was a life-or-death affair. The *Ghetto Chronicle* sketched life on the black market as follows: "in order to get the most out of such dealings, though, it is important to understand and to follow the market. The person who wishes to be successful in the soup trade must be informed about the overall situation: the quality of the goods and the gap between demand and supply."³⁸ "The [rising] demand for food[,] the central tenor of ghetto life, was directly linked to "the inflation on the free market."³⁹ This demonstrates not just how the ghetto black market operated by the Laws of Economics, but that black market prices were then—and are now—the key to calculating accurate inflation statistics.

Due to the voluntary transactions between buyers and sellers, and the tremendous number of price signals exchanged, the black market measured what each item and the currency were worth to ghetto traders. And they knew how to assess value; the lethargy of ghetto life found no home in underground trade. The *Chronicle* noted how the "ghetto has simply been possessed by furious commerce. In front of the gateways to the collectives, on the squares, in the streets, and inside the gateways, all people are doing is selling, trading, and examining goods."⁴⁰ Enterprisers ran from kitchen to kitchen, storehouse to storehouse analyzing the provisions and passing the information

³⁸ Dobroszycki, op. cit., p. 405.

³⁹ Trunk, op. cit., p. 121.

⁴⁰ Dobroszycki, op. cit., p. 159.

along. The *Chronicle* again: “[t]he experienced soup-card buyer knows precisely which kitchen offers soup containing a good deal of grain; or soup with a good deal of cabbage; or as they say [in Yiddish]—a *gedakhte* [thick] soup. These are the factors that determine market trends.”⁴¹ Ghetto traders, in other words, were efficient.

Prices varied by item, and every good included in our CPI basket (explained later) saw an increase in price from 1941-1944. Though the price increases are large, the listed data obscure the full extent of the ghetto’s decaying economic situation. Our data begins in January 1941, *seven months* after the ghetto was sealed and the ghettomark began its course. Ghetto conditions deteriorated during 1940, and prices were likely already elevated by January 1941 when we begin our analysis.

The good with the largest rate increase was *white sugar*, whose price rose 22,400%. Though staggering, the percent changes below don’t necessarily represent the high watermark of ghetto price increases, as the prices of some goods were *not peaking* in the ghetto’s final moments. For example, the final price for beetroot is listed below as 15GM (GhettoMarks), which it was on July 26, 1944, a 900% increase. But the beetroot price a few months earlier, on March 23, 1944, was 150 GM, which yielded a 9,900% rise at that time, though its price level receded to 15GM in the ensuing months. For reference, see Chart I below. Note that a highlight in green indicates a price *increase*, and a highlight in red means a price *decrease*.

Chart I

Good	First available price	Last available price	Percentage Change
Beet Leaves	10 GM	80 GM	700.00%
Beetroot	1.5 GM	15 GM	900.00%
Bread	6.5 GM	750 GM	11,438.50%
Briquette	0.75 GM	6 GM	700.00%
Brown Sugar	130 GM	675 GM	419.00%

⁴¹ *Id.*, p. 405.

Butter	28 GM	3200 GM	11,328.60%
Cabbage	2 GM	5 GM	150.00%
Carrot	0.5 GM	25 GM	4,900.00%
Coal	2 GM	9 GM	350.00%
Coffee/Coffee Mix	1.4 GM	90 GM	6,328.57%
Flour	8 GM	550 GM	6,775.00%
Garlic	10 GM	1200 GM	11,900.00%
Honey	5 GM	50 GM	900.00%
Kasha	12 GM	500 GM	4,066.67%
Kohlrabi	3.5 GM	60 GM	1,614.29%
Lettuce	7 GM	50 GM	614.29%
Margarine	22 GM	1600 GM	7,172.73 %
Marmalade	3 GM	400 GM	13,233.33%
Matches	0.8 GM	15 GM	1,775.00%
Meat	11 GM	1100 GM	9,900.00%
Oatmeal/Oats	12 GM	750 GM	6,150.00%
Oil	11 GM	1200 GM	10,809.10%
Onion	13 GM	120 GM	823.08%
Potato	2.5 GM	200 GM	7,900.00%
Potato Peels	9 GM	40 GM	344.44%

Radish	0.5 GM	70 GM	13,900.00%
Resortow Soup	2.5 GM	5 GM	100.00%
Rye Flour	8.8 GM	150 GM	1,604.55%
Saccharine	0.006 GM	0.625 GM	10,316.70%
Sausage	80 GM	1100 GM	1,275.00%
Sago	60 GM	1000 GM	1,566.67%
Semolina	13 GM	1250 GM	9,515.38%
Soap	0.3 GM	10 GM	3,233.33%
Soup (unspecified)	0.3 GM	2 GM	566.67%
Spinach	18 GM	65 GM	261.11%
Sugar	9 GM	750 GM	8,233.33%
Tobacco	2.9 GM	75 GM	2,486.21%
Wheat Flour	0.7 GM	1.8 GM	157.14%
White Sugar	4 GM	900 GM	22,400.00%
Wood	0.7 GM	7 GM	900.00%

Some goods that traded on the black market did not have consistent, available price data for the whole 1941-1944 period but had data only for shorter time spans or infrequently. Some of the items were extremely rare. For these reasons, they're excluded from our CPI basket. The price changes of these goods are listed here:

Chart II

Good	First Price (Date)	Last Price (Date)	Percentage Change
Apple	7 GM (Sep. 30,1941)	80 GM (Aug. 9, 1943)	1,042.86%
Belgian Cigarettes	0.15 GM (Apr. 28, 1943)	3 GM (Mar. 1944)	1,900.00%
Cigarette (unspecified)	0.04 GM (Nov. 1941)	2.25 GM (<i>Beginning of May</i> 1942)	5,525.00%
Cereal	100 GM (Jan. 24, 1943)	700 GM (Apr. 12, 1944)	600.00%
Cottage Cheese	150 GM (May 26, 1942)	200 GM (Apr. 12, 1943)	33.33%
Fish Oil	60 GM (Oct. 1941)	1500 GM (Sep. 23, 1943)	2,400.00%
“Fruit”	9 GM (July 28, 1941)	140 GM (Sep. 5, 1943)	1,455.56%
Peas	80 GM (June 1, 1942)	450 GM (July 26, 1944)	462.50%
Pickles	5 GM (June 13, 1942)	8 GM (Mar. 14, 1943)	60.00%
Powdered Milk	150 GM (Jan. 15, 1943)	300 GM (Dec. 23, 1943)	100.00%
Rice	14 GM (<i>Before July 26,</i>	700 GM (Aug. 16,	4,900.00%

	1941)	1942)	
Rye Flakes	110 GM (June 14, 1942)	550 GM (Mar. 5, 1944)	400.00%
Sauerkraut	10 GM (Jan. 24, 1943)	250 GM (Mar. 5, 1944)	2,400.00%
Tea	30 GM (<i>Before</i> July 26, 1941)	100 GM (Feb. 18, 1944)	233.33%
Tomato	4.5 GM (Sep. 30, 1941)	100 GM (Sep. 5, 1943)	2,122.22%
Yugoslav Cigarettes	4 GM (May 15, 1942)	1.5 GM (Nov. 20, 1943)	62.50%

Prices generally flared up during importations of new inmates, deportations, supply shortages, ration decreases, and when bad news or rumors circulated. Prices tended to drop when deportations halted, the quality of the good(s) decreased, ration increases, good news or rumors spread, and after Jewish holidays when the general mood improved.

Black market prices were not uniform in the Łódź Ghetto. In Marysin, for example, at the outskirts of the ghetto, black market prices sometimes ran higher than in the marketplaces. And occasionally, our various sources listed different prices than each other. However, the different sources included in this study generally showed a very close reporting of prices and as the *Chronicle* noted in 1942, “throughout the ghetto’s existence, those [black market] prices had displayed an admirable uniformity (both in time and in relation to the ghetto’s various far-flung districts).”⁴²

One final point: some of our price input values are estimates, though backed by the data and findings from primary sources as much as possible. For instance, when a given price is a range, we typically input an average between them. Like on February 13, 1941, the *Chronicle* listed the

⁴² *Id.*, p. 118.

black market price of bread as “8.5–10” ghettomarks. We therefore used a 9.25 GM value—the average—for that price point.

Hyperinflation

One of the authors (Hanke) noted that “the literature on hyperinflation is riddled with a variety of definitions,” though the “cornerstone” of definitions was established by the late economist Phillip Cagan.⁴³ Cagan defined a “hyperinflation” as a price level increase of at least 50% per month. Hanke elaborates on Cagan’s definition, claiming that an episode of hyperinflation starts when there are thirty consecutive days in which the price level increases by at least 50%.” Once the monthly inflation rate drops below 50% and “stays there for at least one year,” the episode is said to end.

Following Cagan’s 50% rule and Hanke’s modifications, the authors confirmed that the Łódź Ghetto experienced hyperinflation in March of 1942. This would make the Łódź ghettomark one of 63 currencies in history to hyperinflate.⁴⁴

Method One: The Dollar Index

Following the work of one the authors (Hanke), “the most important price in an economy is the exchange rate between the local currency and the world’s reserve currency”, such as the U.S. Dollar.⁴⁵ As long as there is an active black market (read: free market) for currency and the data are available, changes in the black market exchange rate can be reliably transformed into accurate measurements of countrywide inflation rates. The economic principle of purchasing power parity (PPP) allows for this transformation. And because there was an active black market within the Łódź Ghetto, changes in the black market exchange rate (denominated in ghettomarks) can be transformed into estimates of inflation rates within the ghetto. Beyond the theory of PPP, the intuition of why PPP represents the ‘gold standard’ for measuring inflation during hyperinflation episodes is clear. All items in an economy that is hyperinflating are either priced in a stable foreign currency (the reichsmark) or a local currency (the ghettomark). If they are ghettomark prices, they

⁴³ Hanke, Steve H., and Nicholas Krus. “World Inflation and Hyperinflation Table.” *Cato Institute*, 18 Aug. 2014, www.cato.org/research/world-inflation-and-hyperinflation-table, p. 10.

⁴⁴ *Ibid.*

⁴⁵ Hanke, Steve H., and Bushnell, Charles (2017). On measuring hyperinflation: Venezuela’s episode. *World Economics* 18,3, p. 10.

are determined by referring to the reichsmark prices of goods, and then converting them to local ghettomark prices after checking with the spot black-market exchange rate. This held true in the Łódź Ghetto.⁴⁶ Indeed, when the price level is increasing rapidly and erratically on a day-by-day, hour-by-hour, or even minute-by-minute basis, exchange rate quotations are the only source of information on how fast inflation is actually proceeding. This, too, held true in Łódź. That is why PPP holds and why we can calculate the Łódź Ghetto's inflation rate.⁴⁷

Ghetto dwellers understood that the exchange rate between the local currency and a more stable one contains an informative, vital, and useful price in an economy. During the resettlement chaos of May 1942, the *Chronicle* noted that “[t]he German mark, whose exchange rate has acted as a barometer of tension during the deportation action, fell to below 7 [ghetto] marks on the eve of the action's conclusion, with no buyers whatsoever. These signs have made the population of the ghetto a bit optimistic after having been in a state of complete depression and exhaustion.”⁴⁸

Inflation rates were therefore calculated using exchange rate data for the ghettomark. Limited, though still monthly, exchange rate data was available from January 1942 through May 1942. These data provided exchange rates between the ghettomark and reichsmark. Information regarding Nazi inflation rates was scarce, so we needed a different base currency and selected the U.S. Dollar to measure inflation in the Łódź Ghetto. The authors used black market reichsmark/dollar exchange rates (compiled in Franz Pick's *Currency Yearbook*) to calculate month-end ghettomark/dollar exchange rates from January 1942 to May 1942. Using the monthly inflation rate of the dollar, monthly ghetto inflation rates were calculated for February 1942 through May 1942. To calculate inflation within the Łódź Ghetto, the principle of Relative PPP was invoked. According to Hanke, “Relative PPP relates the percentage change in the exchange rate between two currencies to the inflation rate differential between two countries.”⁴⁹ Hanke's formula for Relative PPP can be found below.

⁴⁶ See, e.g., Trunk, op. cit., p. 286 (quoting a ghetto diary that “[t]he most proven and effective means [of bribing Jewish policemen] is money; of course, not any *rumkes* [ghettomarks]. But even *rumkes*, when one has a whole lot of them, are currency. Dollars are a very good currency, not to mention in gold!... German marks are also accepted tender”).

⁴⁷ See Hanke, Steve. “Venezuela's Hyperinflation and the IMF's Faulty Forecasts.” *Forbes*. 11 July 2018, <https://www.forbes.com/sites/stevehanke/2018/04/25/the-ins-and-outs-of-venezuelas-hyperinflation-spotlights-on-the-imf-and-the-financial-press/?sh=5d44fec8103c>Hanke.

⁴⁸ Dobroszycki, op. cit., p. 173.

⁴⁹ Hanke and Bushnell, *On measuring hyperinflation*, p. 12.

Changes in this exchange rate are transformed into inflation rates in the ghetto using the following formula:

Let:

P_A = the price level in the Łódź Ghetto in ghettomarks

P_B = the price level of the United States in US dollars

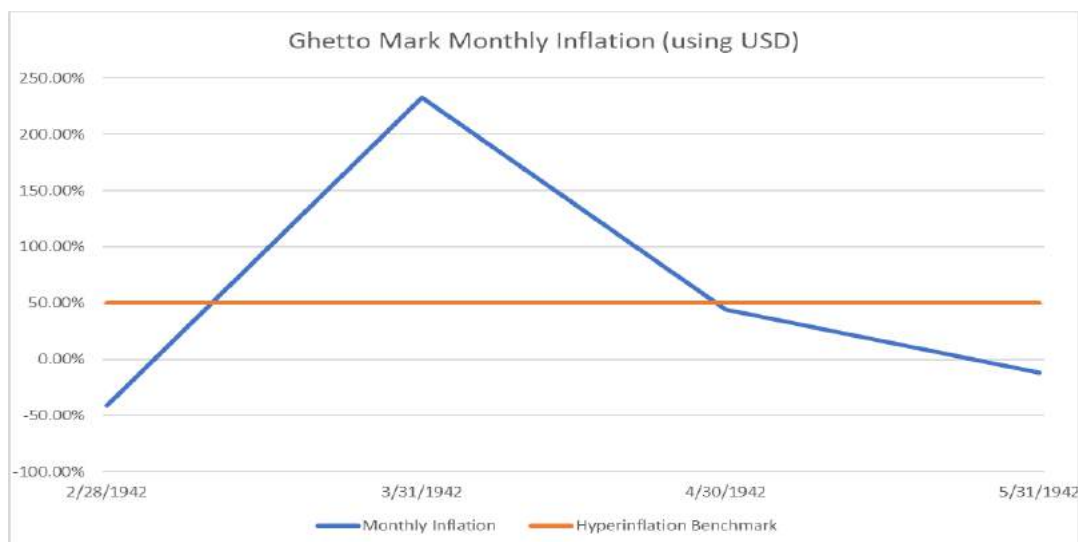
$S_{A/B}$ = the exchange rate (ghettomarks/US dollar)

$$\frac{\Delta P_A}{P_A} = \left[\left(1 + \frac{\Delta P_B}{P_B} \right) \left(1 + \frac{\Delta S_{A/B}}{S_{A/B}} \right) \right] - 1$$

The calculated inflation rates can be found in the graph and table below.

Chart III

Date	GM/RM Exchange Rate	RM/USD Exchange Rate	Implied GM/USD Exchange Rate	Ghetto Monthly Inflation Rate
Jan 1942	1.5	45.6522	68.4783	N/A
Feb 1942	1	35.8974	35.8974	-41.24%
Mar 1942	3	35.2941	105.8823	232.42%
Apr 1942	4	33.871	135.484	44.08%
May 1942	3	35.2941	105.8823	-11.53%



This data finds that the Łódź Ghetto experienced hyperinflation in March 1942, with a monthly inflation rate of 232.42%.

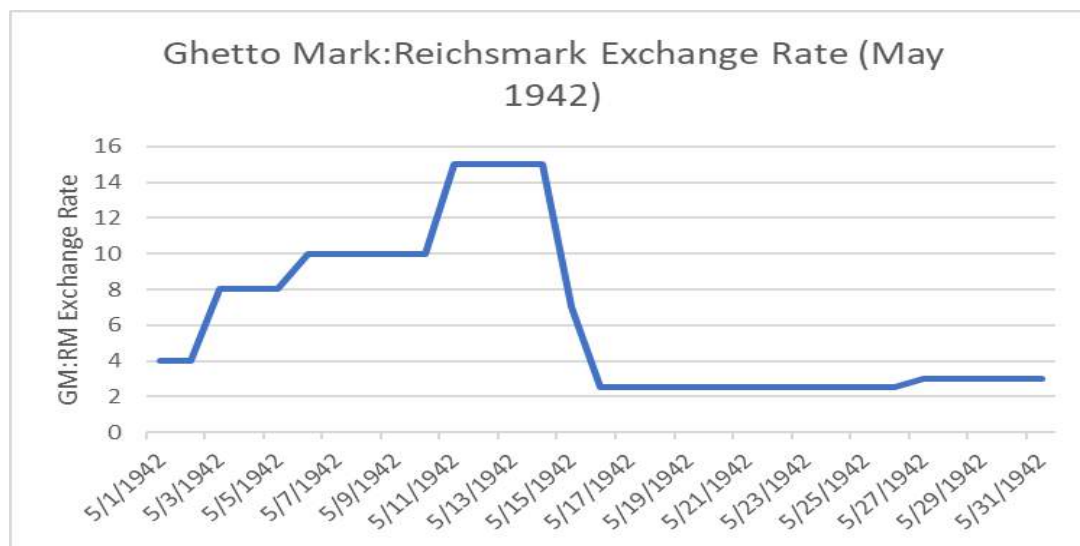
Exchange rate data also allows us to measure how tumultuous May 1942 was for ghetto residents, in which the *Chronicle* counted 7,051 Jews moved *into* the ghetto,⁵⁰ and 11,680 *left* the ghetto, 10,914 of whom (93.4%) were “resettled[,]”⁵¹ constituting some of the largest population movements in ghetto history. These upheavals were the spur to frantic black market currency exchange activity throughout the month of May. The exchange rate rose from the April level of 4GM:1RM to 8-10:1 in the first week of May; 10:1 in the second week; 12-15:1 at the end of the second week; 7:1 at the start of the third week (May 15th) when deportations halted, and then dropped to 2.5:1 on May 16th, the day after the deportations stopped. In the last few days of the month, the rate trickled up to 3:1, finishing the volatile month lower than it had started. And because we used end-of-month exchange rate data for the Dollar Index calculations, the May 1942 rate on the Dollar Index is said to have declined, though there were (almost certainly) hyperinflationary exchange rates in the first half of the month. Our other two indices, the CPI and “Bread” baskets (explained later), measured rates for May at 192.20% and 281.43%, respectively, the highest recorded for each index. Ghetto inflation in May became so pernicious that the *Judenrat* “raised the [official] prices of all foods by 50 to 100 percent, and....at the same time the rates for electricity and gas were raised.”⁵² The *Ghetto Chronicle*, with its typical economic sagacity,

⁵⁰ Dobroszycki, op. cit., p.193

⁵¹ *Id.*, p. 194. They were, in fact, gassed at Chelmno.

⁵² *Id.*, p. 192.

diagnosed the inflationary problem as a monetary phenomenon: “[t]he total lack of small change was also a great plague and a factor in the price increases...the currency in circulation, which had formerly amounted to only 1.2-1.5 million marks, rose to 5.5 million marks in May.”⁵³ See the following graph:



Method Two: Basket

The custom and practice of identifying hyperinflation is to use exchange rates, as Cagan and Hanke make clear, and as was done above. But the authors of this paper also calculated related and supporting economic data to measure the economic state of its residents and add color to what was going on in the ghetto. Using an extensive list of black market prices for a wide variety of items, the authors created a CPI basket to analyze price changes in the ghetto. The CPI is especially valuable because the inflation rates in both the CPI and “Bread” basket use a monthly *average* based on daily prices, as opposed to the exchange rate index which uses *month-end* data. The two former metrics therefore include higher-frequency data as well as factor intra-month changes and volatility. And we have price data from January 1941 through July 1944.

For some of the goods for which price information was available, the data was either inconsistent or missing. As a result, these goods were excluded from consideration in the basket. Some of these items (most notably, cigarettes) were staples within the ghetto and in black market

⁵³ *Ibid.*

dealings, but the authors were forced to exclude them due to limited data on both quality and prices, which may have a small impact on the accuracy of the final percentages.

Typically, economists weigh CPI baskets based on the share of each good in an average household's expenditures.⁵⁴ Such household spending data wasn't available in the ghetto, though economist Vincent Bignon's paper *Cigarette Money and Black Market Prices around the 1948 German Miracle* offers two criteria for liquidity that can be utilized for crafting a ghetto CPI: (1) a coverage ratio, measuring the probability that a given good is sold on a given black market; and (2) the price dispersion across locations.⁵⁵ To satisfy the first criterion, the ghetto's basket was weighted based on the frequency that each good's price surfaced in the data. Per our logic, the frequency with which a price of a good was reported by ghetto diarists indicates the item's availability for purchase. And an item's availability for sale on the black market likely correlated to its likelihood of having been sold. To establish consistency, however, the authors included only ghettomark (and not barter or other currency) transactions in the calculations.

The authors satisfied Bignon's second criterion due to the regular reporting of the prices of goods from various sources as well as the previously discussed convergence of black market prices throughout the ghetto.

The basket's weightings can be found in Chart IV. Note that foods and beverages were weighted more (88.32%) than non-foods and beverages (11.68%), and that bread and potatoes carry the most weight in the basket.

Chart IV

Good	Weight
Beetroot	2.53%
Beet Leaves	0.58%
Bread	14.80%

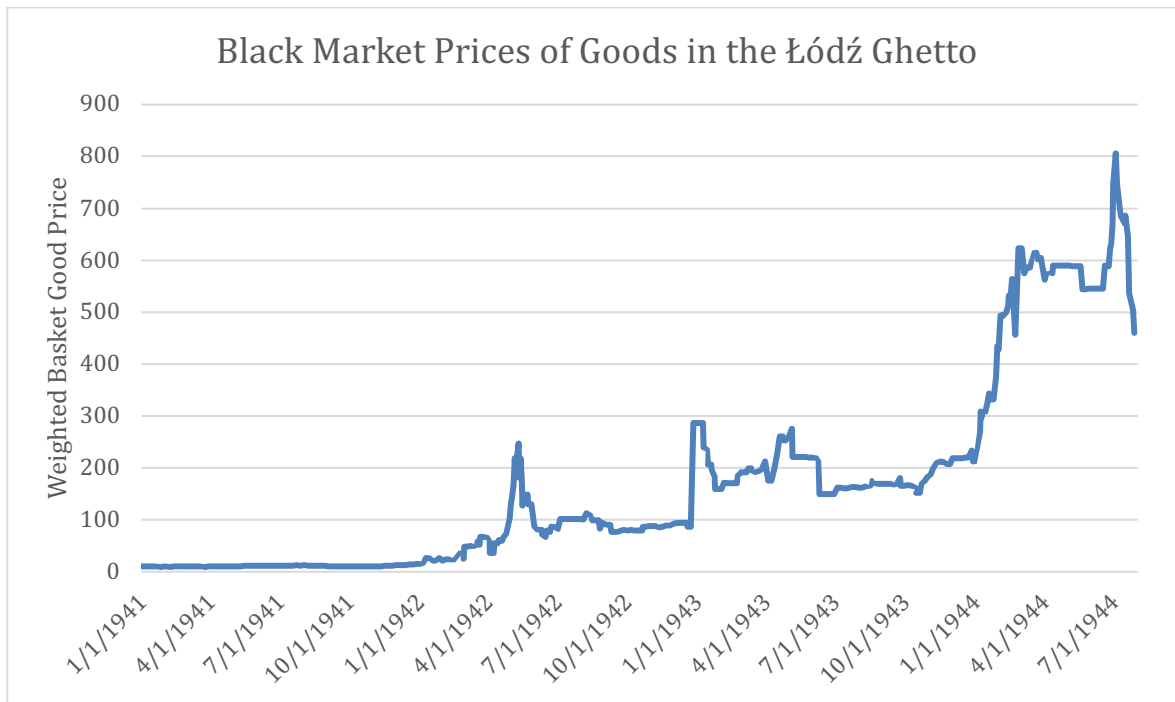
⁵⁴ EconPort. "Consumer Price Index." Econport.org, 2019, www.econport.org/content/handbook/Inflation/Price-Index/CPI.html.

⁵⁵ Bignon, Vincent. "Cigarette Money and Black Market Prices around the 1948 German Miracle," *EconomiX Working Papers 2009-2*, University of Paris Nanterre, EconomiX, 2009, p. 2.

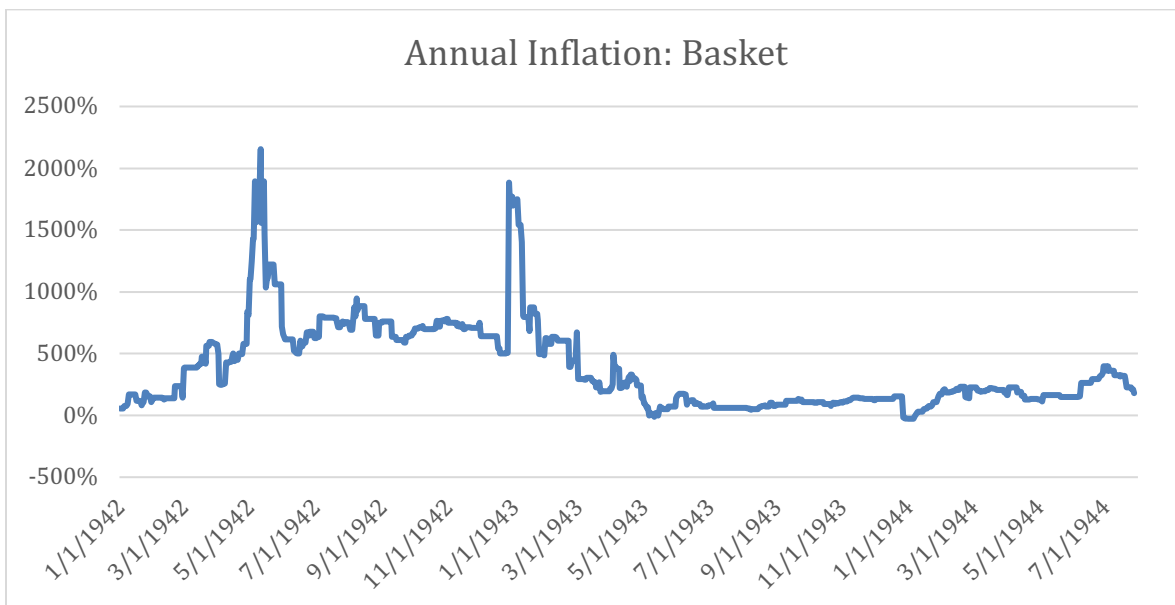
Briquette	2.14%
Brown Sugar	1.10%
Butter	3.11%
Cabbage	1.10%
Carrot	1.69%
Coal	2.34%
Coffee/Coffee Mix	0.97%
Flour	4.35%
Garlic	1.36%
Honey	0.71%
Kasha	2.01%
Kohlrabi	0.71%
Lettuce	0.52%
Margarine	5.91%
Marmalade	0.78%
Matches	1.82%
Meat (unspecified)	1.62%
Oatmeal/Oats	0.45%
Oil	4.15%
Onion	2.53%

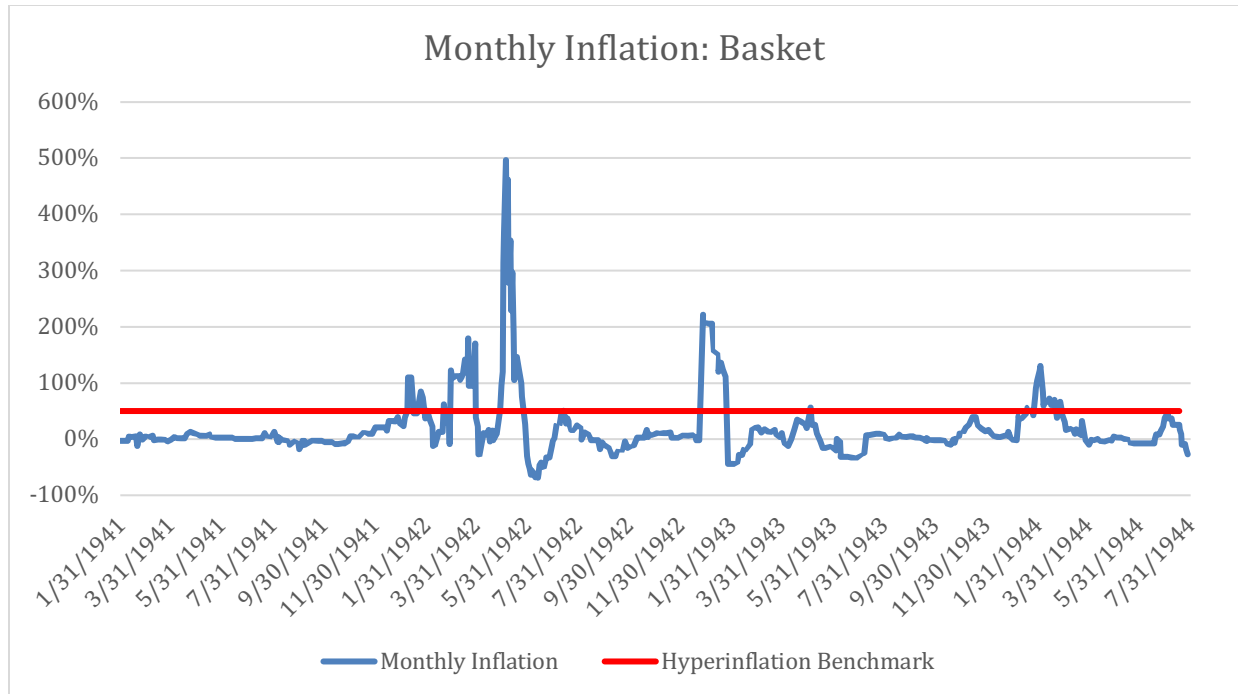
Potato	10.45%
Potato Peels	0.71%
Radish	2.21%
Resortow Soup	2.53%
Rutabaga	2.14%
Rye Flour	1.17%
Saccharine	3.63%
Sausage	1.88%
Semolina	0.78%
Sago	0.65%
Soap	0.65%
Soup (unspecified)	2.27%
Spinach	1.10%
Sugar	6.42%
Tobacco	0.91%
Wheat Flour	0.65%
White Sugar	0.71%
Wood	3.83%
Total	100.00%

See the following graph for the rise in the prices of the goods in the Łódź Ghetto.



Using the weightings listed above, the annual inflation rate was calculated from January 1942 through July 1944 and monthly inflation rates were calculated from February 1941 through July 1944. Graphs of the annual and monthly inflation rates within the ghetto (using the basket) are below:





See the rightmost column in Chart V below for the monthly inflation values.

Method Three: Bread Index

In the Łódź Ghetto, bread served as a monetary instrument.⁵⁶ Despite its limited shelf life, it was used as a unit of account, a medium of exchange, and “played the role of a universally recognized measure of value and item of trade.”⁵⁷ Black market prices were often listed—not in ghettomarks—but in amounts of bread. The *Ghetto Chronicle* described how “the trend in prices for the most important foodstuff, i.e., bread, goes along with the populace’s supply of potatoes and also reflects the general cross section of prices. In that regard, the price of bread can always be considered an authoritative indicator of the situation in the food market.”⁵⁸ And “even though many people do not buy bread in the market...they are, nevertheless, subject to depression and to concern about the future in the face of the alarming disproportion between the price of a loaf of bread and

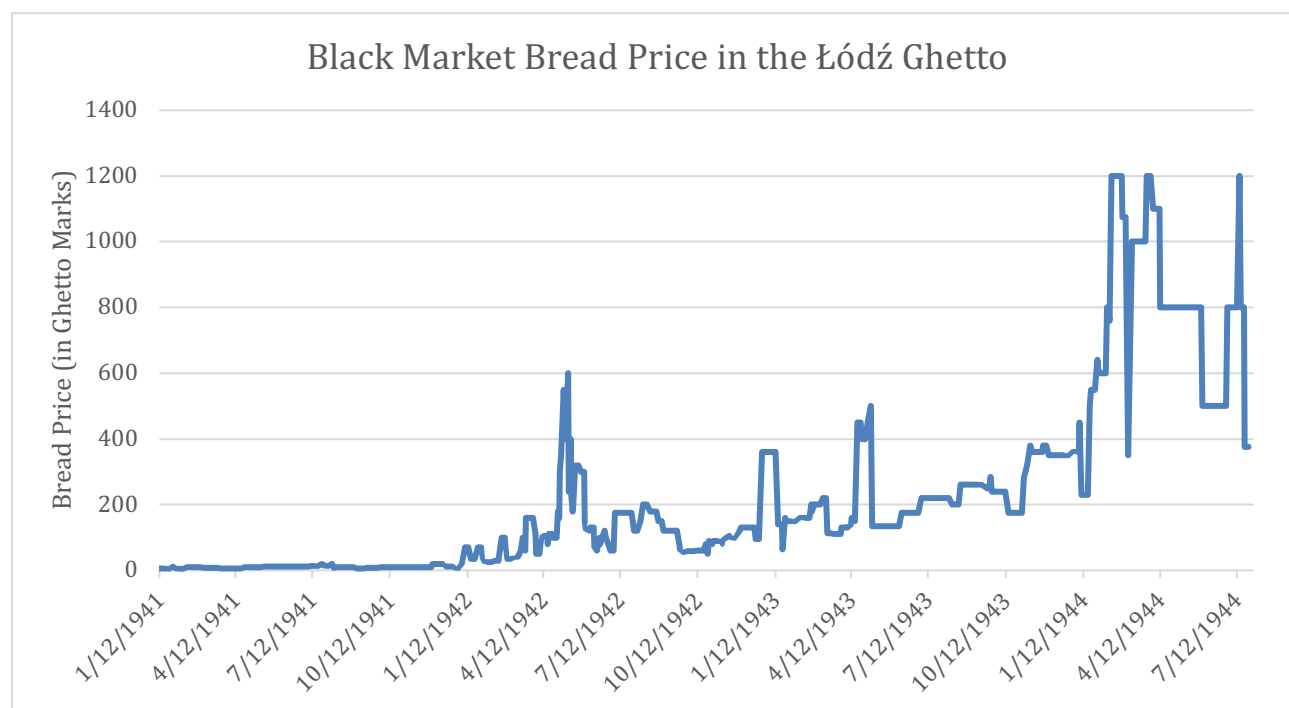
⁵⁶ The use of food-as-money is common in history. See Johnson, Paul. *A History of the Jews*. Harper and Row, 1988, p. 172 (describing the long history of food-money in the shape of olives, dates, seeds, and animals recorded as early as c.5000 BC); see also Schweikart, L., & Allen, M. *A Patriot's History of the United States*. Sentinel, 2019, p.148 (noting the use of whiskey as money on the 1790s American frontier); Bignon, op. cit., p.9 (“[C]igarettes, chocolate, candy bars and alcohol were regular means of payment” in postwar Germany).

⁵⁷ Trunk, op. cit., p. 115.

⁵⁸ Dobroszycki, op. cit., p. 118.

a monthly salary.”⁵⁹ Bread thus did for the entire ghetto economy what economist Milton Friedman observed that prices do: (1) transmit information, (2) provide an incentive to users of resources to be guided by this information, and (3) provide an incentive to owners of resources to follow this information.⁶⁰

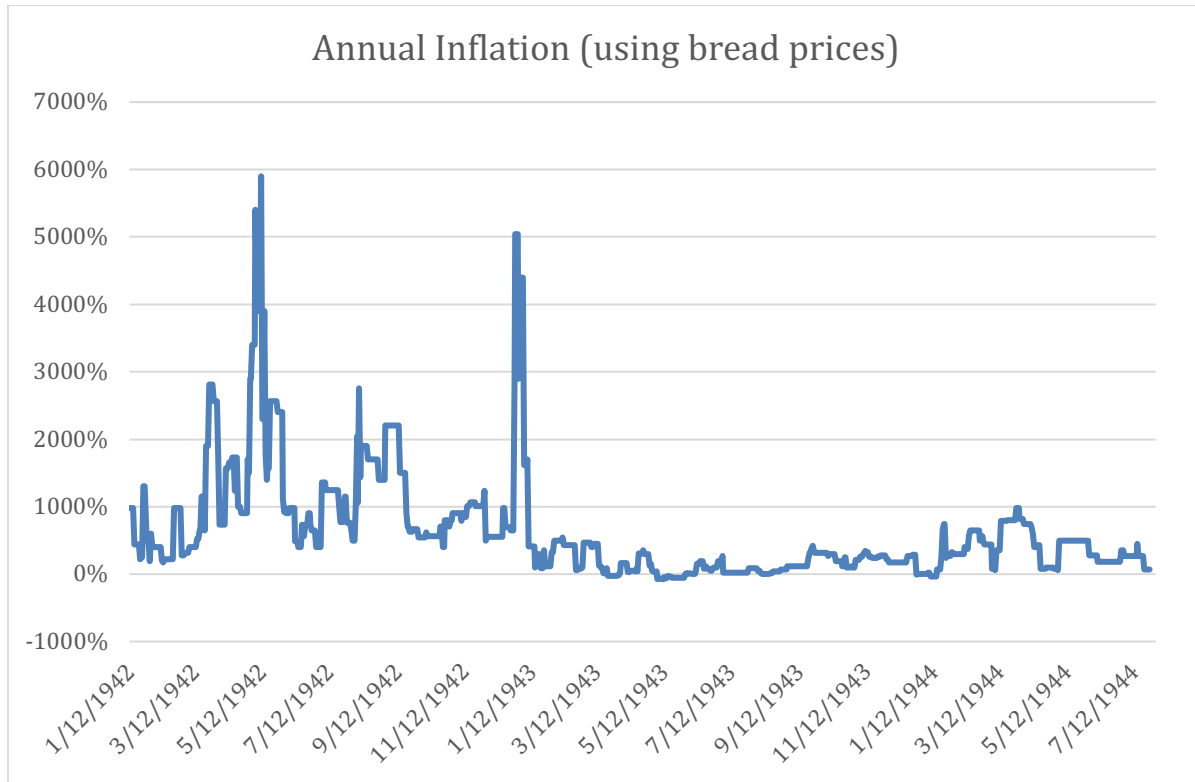
The authors constructed a “Bread Index” using data on prices compiled from January 1941 through July 1944. The black market price of bread between those dates rose 11,438.50%, from 6.5GM to 750GM. Bread’s cheapest black market price on record in the ghetto was 5.2GM in September 1941, and its crest was 1,200GM, which it reached in several 1944 months. Interestingly, during the Passover holiday, when Jews traditionally abstain from bread, the price of bread often dropped, and matzo surfaced in ghetto trading. A graph of bread prices in the Łódź Ghetto can be found below:



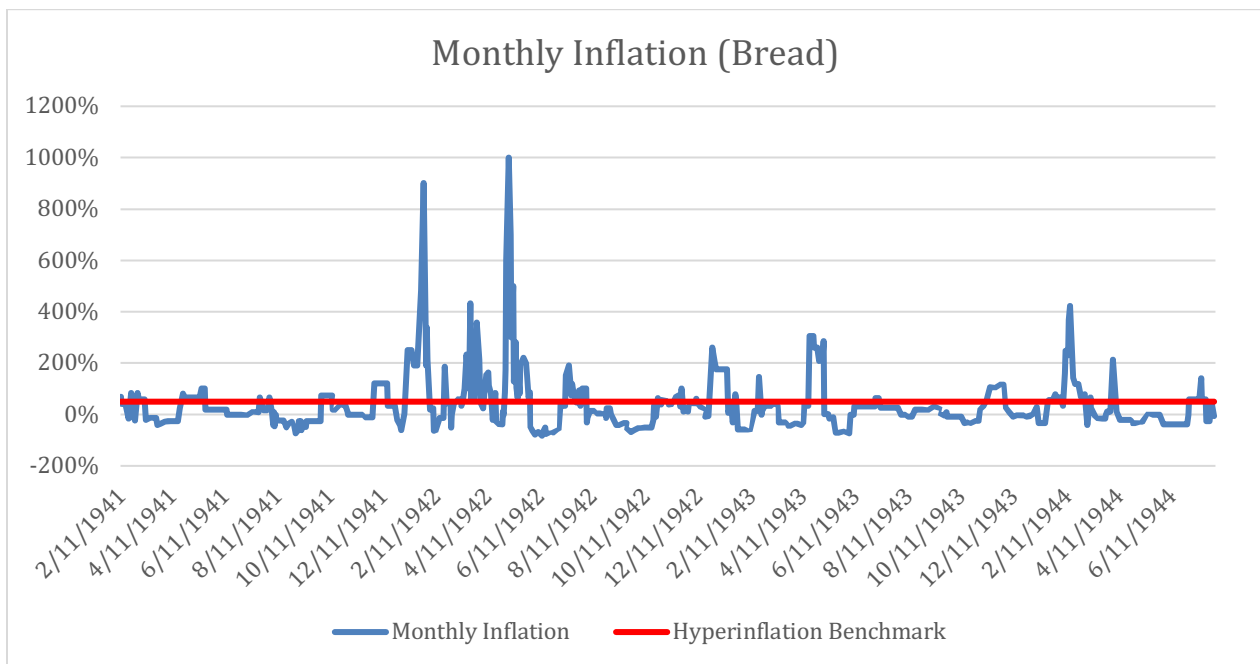
Annual inflation was measured from January 1942 through July 1944. A graph depicting the annual inflation rate (using the Bread Index) within the ghetto can be found here:

⁵⁹ *Ibid.*

⁶⁰ See generally Friedman, Milton. *Price Theory*. Aldine Publ. Co., 1976.



The authors also calculated monthly Bread-indexed inflation rates from February 1941 through July 1944. A graph depicting this data can be found below. See the second rightmost column in Chart V for these per-month inflation values.



Indices Compared and Hyperinflation Supported

To analyze hyperinflation, monthly inflation rates were used. When the exchange rate metric (USD) demonstrates a rate of at least 50% per month, that month is hyperinflationary. This happened only in March 1942. In Chart V below, entries highlighted in **yellow** show the month where at least one (but not all) of available inflation methods eclipsed 50% per month. Entries highlighted in **green** show the months when all available methods exceed 50% per month. **Bold** indicates a hyperinflation (i.e. at least 50% per month on the exchange rate (USD) index).

Chart V

Date	Monthly Inflation (USD)	Monthly Inflation (Bread)	Monthly Inflation (Basket)
Feb-41	#N/A	30.18%	0.52%
Mar-41	#N/A	5.76%	0.28%
Apr-41	#N/A	4.15%	4.92%
May-41	#N/A	53.98%	5.39%
Jun-41	#N/A	8.67%	1.16%
Jul-41	#N/A	14.92%	2.98%
Aug-41	#N/A	-16.15%	-1.48%
Sep-41	#N/A	-37.28%	-6.08%
Oct-41	#N/A	46.27%	-6.47%
Nov-41	#N/A	-3.67%	7.62%
Dec-41	#N/A	71.47%	26.60%
Jan-42	#N/A	249.60%	62.82%

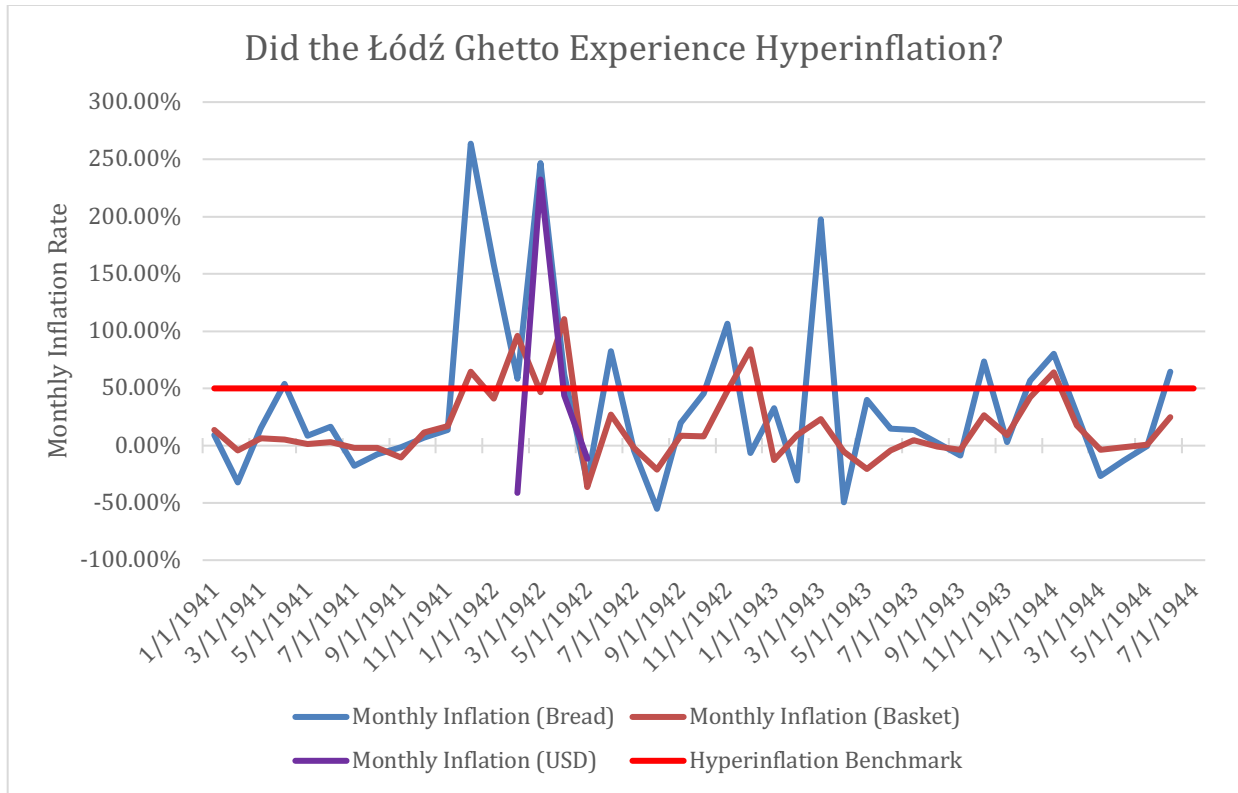
Feb-42	-41.24%	26.98%	19.76%
Mar-42	232.42%	104.12%	112.92%
Apr-42	44.08%	52.75%	4.88%
May-42	-11.53%	281.43%	192.20%
Jun-42	#N/A	-68.48%	-47.91%
Jul-42	#N/A	70.93%	26.05%
Aug-42	#N/A	15.46%	2.04%
Sep-42	#N/A	-41.63%	-18.64%
Oct-42	#N/A	-17.63%	1.03%
Nov-42	#N/A	47.91%	7.72%
Dec-42	#N/A	59.98%	38.23%
Jan-43	#N/A	76.16%	115.46%
Feb-43	#N/A	-2.19%	-17.57%
Mar-43	#N/A	-4.79%	13.63%
Apr-43	#N/A	103.07%	12.49%
May-43	#N/A	9.29%	5.66%
Jun-43	#N/A	12.42%	-24.84%
Jul-43	#N/A	33.87%	-2.26%
Aug-43	#N/A	6.35%	3.47%
Sep-43	#N/A	12.41%	1.25%

Oct-43	#N/A	-19.94%	-2.19%
Nov-43	#N/A	75.18%	23.97%
Dec-43	#N/A	5.01%	7.64%
Jan-44	#N/A	16.32%	41.25%
Feb-44	#N/A	169.36%	71.14%
Mar-44	#N/A	5.25%	17.35%
Apr-44	#N/A	15.87%	-2.84%
May-44	#N/A	-10.07%	-1.60%
Jun-44	#N/A	-36.25%	0.72%
Jul-44	#N/A	40.89%	12.10%

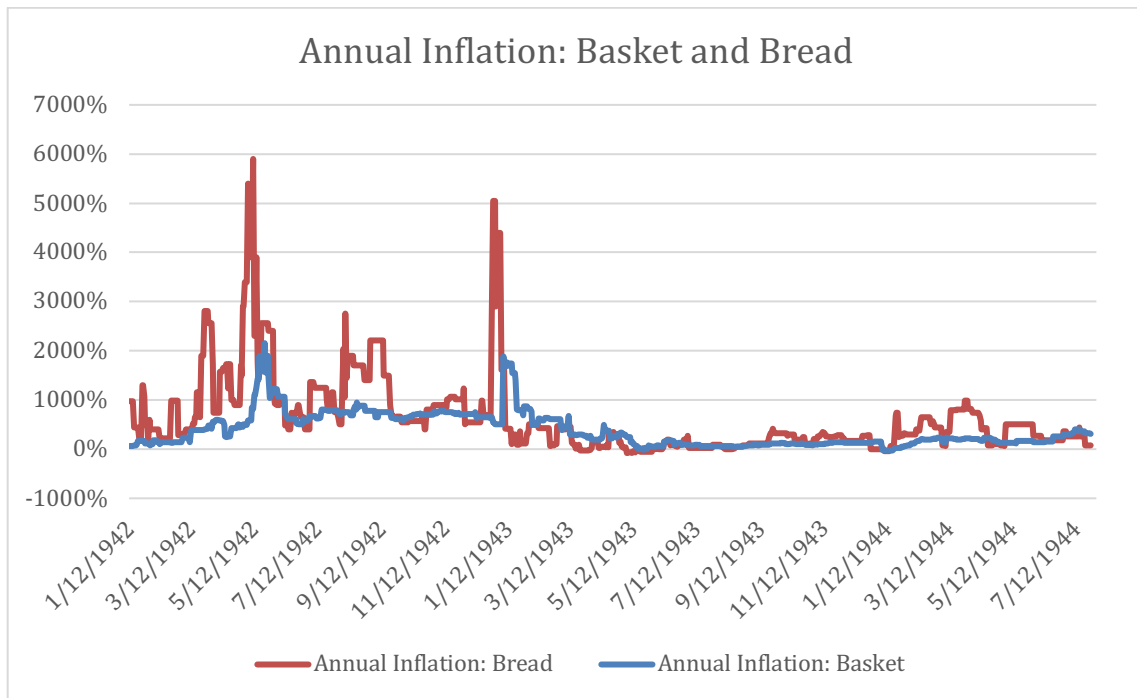
As the chart displays, the March 1942 hyperinflation found using exchange rates is corroborated by the Basket Index and Bread Index, which both cross the 50% monthly hyperinflation threshold in March 1942—at 112.92% and 104.12%, respectively.

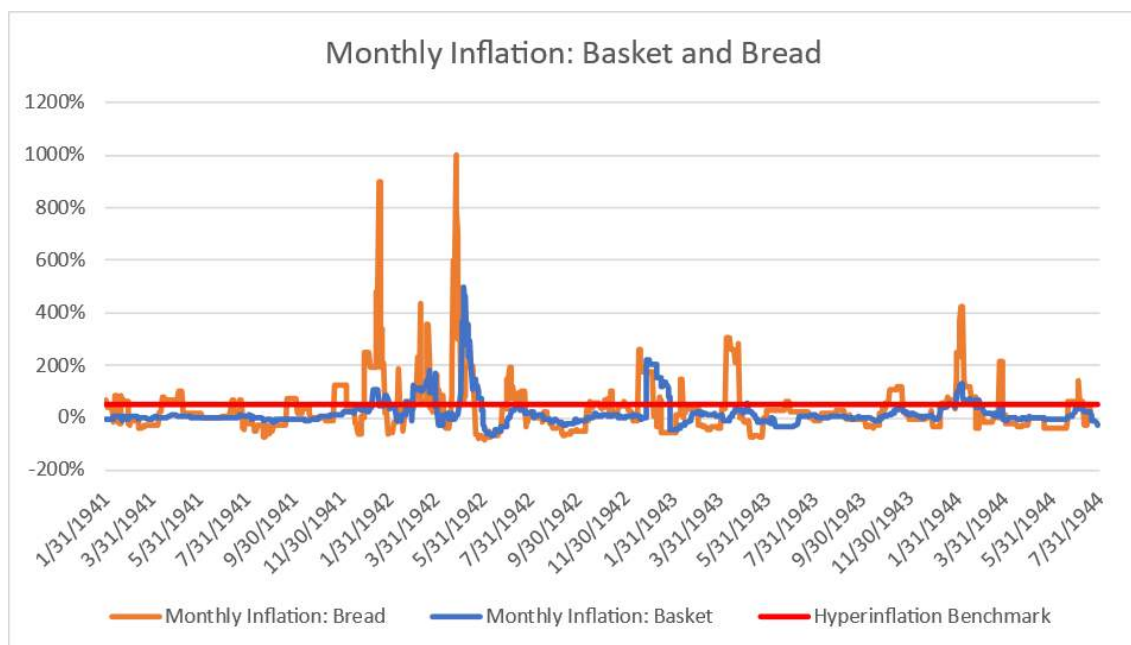
Three additional times—January 1942, January 1943, and February 1944—both the Basket and Bread Indices measured monthly inflation rates above 50%, *suggesting* that the Łódź Ghetto may have been hyperinflating (but due to a lack of exchange rate data, the authors were unable to calculate monthly inflation rates using the Dollar Index). Without exchange rate data we cannot conclude with scientific certainty that the Łódź Ghetto was hyperinflating in those months. But the authors still seek to uncover insights into the economic profile of the ghetto by using the other indices' indications of potential, additional hyperinflations.

See the graph below plotting the monthly inflation rates of all methods utilized.



The above graph displays a general correlation between the Basket and Bread Indices, though bread was more volatile than the basket. See comparison graphs here:





Price changes in bread were more extreme than those of the basket, but the annual inflation spikes mirrored one another. Both indices' *highest recorded* annual levels occurred on the same day: May 11, 1942 (at 2,155% on the Basket Index, and 5,900% on the Bread Index). Amazingly, the *highest recorded* black market exchange rate datum we possess—15:1 GM:RM—was also from May 11th, 1942. That the zenith of all three indices converged *on the same day* supplies further evidence for the efficiency of the ghetto black market economy, the accuracy of the ghetto data, and of the authors' methods.

That May 11th, 1942 was the most inflationary day in ghetto history is no surprise. As explained earlier, the first two weeks of May 1942 saw some of the largest—and most unsettling—ghetto population transfers, as well as rapid increases in the money supply.

The second-most inflationary period using the Bread and Basket Indices' annual rates was The end of December 1942 through the beginning of January 1943, when the annual inflation rate of the Bread Index hit 4,400% on January 1st-4th, and the annual basket rate hit its second-highest level a few days earlier on December 27, 1942, at 1,882%.

Consider a brief detail of the events surrounding each of the months that all available indices showed inflation above 50% per month (the **green** months from Chart V), and our hypotheses on the hyperinflationary causes.

January 1942

Ghetto inflation had begun rising sharply in December in 1941, and 1942 had an inauspicious inception. By January 8th, the telltale signs of hyperinflation began to surface as the *Chronicle* documented “[f]or the last few days the prices of food in the ghetto’s private market have been increasing from one day to the next, and even from one hour to the next.”⁶¹ The *Chronicle*’s assessment was that the inflationary chaos was created by a rapid growth in the money supply, noting that a few weeks prior, the ban on mail was lifted, and “over three quarters of a million [German] marks flowed into the ghetto” from abroad, in what it termed “a constant avalanche of money orders.”⁶² “The new population,” it added, of Western European Jews recently moved into the Ghetto, were “funded with money from outside the ghetto.”⁶³ The *Chronicle* lamented that the private market was diluted with excess money because “although these are cash transactions, they have all the characteristics of barter.”⁶⁴ With a massive growth in liquidity and the same number of goods, therefore, inflation was the natural consequence. The *Chronicle* highlighted that due to the “role of the private market as a regulator of commodities, which is of considerable significance, it should be realized that this market makes it possible for the public at large to engage in transactions that are advantageous from the point of view of bettering one’s own economic situation.”⁶⁵ Unfortunately, it noted, the introduction of money not backed by consumable products “destroyed the role the food market has thus far been playing, that of regulator of commodities... [a]nd now chaos has set in.”⁶⁶ Further bedlam arose from the first of the major deportation actions, which began on January 16th, and through the 29th.⁶⁷

March 1942

Hyperinflation in this month appears to have been spawned by the order—effective March 1st—that copper coins were to be taken out of circulation and replaced with alloyed coins.⁶⁸ The

⁶¹ Dobroszycki, op. cit., p. 116.

⁶² *Id.*, p. 118.

⁶³ *Ibid.*

⁶⁴ *Id.*, p. 117.

⁶⁵ *Ibid.*

⁶⁶ *Id.*, p. 118.

⁶⁷ See Sitarek and Gucio, op. cit., p. 217 (noting that the 10,003 chosen for “resettlement” in January 1942 were gassed at Chelmno).

⁶⁸ Dobroszycki, op. cit., p. 132.

inflationary effects of this currency devaluation may have accelerated in a place like the ghetto where coins were often beaten down to their raw elements and “became a source of heat when ghetto inhabitants burned them instead of the virtually nonexistent fuel.”⁶⁹ And the ensuing currency issues emerged immediately. In the Łódź Ghetto *Diary of an Anonymous Girl*, she witnessed on March 16, 1942 “a problem with small change.... [p]eople give fifty pfennigs instead of ten. Until now, they have exchanged ghetto [marks] for German marks, but nowadays people don’t make any business with coins. I had to leave fifty pfennigs at the cashier’s, because I don’t have any change.”⁷⁰ As explained earlier, these lingering coin problems would also unleash inflationary pressures in May 1942.

A second relevant factor is the ‘resettlements’ that began in January and continued into snowy March. The *Chronicle* wrote that “March will be remembered in the ghetto annals as the month of deportations. From early morning, without any break, processions of deportees headed to Marysin[.]”⁷¹ Needing to rid themselves of all ghettomarks, the deportees flooded the private markets, driving up prices.

January 1943

On December 8, 1942, the *Judenrat* began to issue 100,000 newly minted 10-pfenning coins “[o]n the first day” alone, and “more are being produced by the metal factory every day.”⁷² This rapid increase in the money supply may have contributed to the sharp rise in inflation in the final days of December and into January 1943, which, as noted above, contained the second-highest set of annual inflation rates measured in ghetto history.

February 1944

On January 7th, 1944, the *Chronicle* observed that 5,000 new 10-mark coins entered circulation every day, in addition to a big batch of 20-mark bills. Two days later, the *Chronicle* exclaimed “all the prices are going up!” and wild price fluctuations racked black market trade.

⁶⁹ See Forman, Joel J. “Holocaust Numismatics.” Museum of Tolerance, www.museumoftolerance.com/education/archives-and-reference-library/online-resources/simon-wiesenthal-center-annual-volume-2/annual-2-chapter-8.html#10.

⁷⁰ “Diary Entries on Deportations from the Łódź Ghetto.” *Facing History and Ourselves*, www.facinghistory.org/resource-library/text/diary-entries-deportations-d-ghetto#endnote5.

⁷¹ Sitarek and Gucio, op. cit., p. 219.

⁷² Dobroszycki, op. cit., p, 298.

This money supply bump led to the January inflation measurements taking a sharp rise, approaching the 50% monthly rate on the CPI and surpassing it on the Bread Index. “At the end of January 1944, the [ghetto] Bank was liquidated and all valuable goods still remaining in storage were seized by the German Administration of the ghetto.”⁷³ Lacking the physical ‘reserves’ necessary to back its spending, the *Judenrat*’s money printing went into overdrive. On February 4th, the *Chronicle* noted in astonishment that “10-mark coins are still being minted” and noted in several February entries that about 2 million marks worth of them were minted on top of the large supply of other mark denominations, including “400,000 five-mark coins”⁷⁴ that were recently struck and released to the populace. The Jewish monetary authorities had abandoned all economic discipline. The *Chronicle* explained: “[t]oday it is not yet certain how many coins will be minted. Asked about the value of ten-mark coins to be minted, the head of the Central Treasury, Salomon Ser, gave us *a reply hitherto unheard of in the field of financial management*: ‘it depends on how much metal Chimowicz (Metalwork Department) can give us.’ His response summarizes the situation.”⁷⁵ Together with resettlement actions, by the end of February, the inflation rates (via all available calculation methods) had crossed the 50% monthly mark.

Black Market Premium:

Rumkowski and the *Judenrat* set official prices for all points of sale in the ghetto, in what the *Chronicle* rightly branded “a price ceiling[.]”⁷⁶ Rumkowski created a special “OS [Order Service of Police] Division for Price Control. This unit controls the prices of food, both in shops and on the streets and in markets.”⁷⁷ The black market existed and thrived in large measure to skirt these diktats. The divergence between the prices were at times enormous, like in late September of 1943, where the gap between the official and free prices for butter stood at 94,900%. The *Chronicle* detected that in 1943 “[t]he difference between the legal and the private market price is so great that, for example, someone selling a single sausage ration can, with the money obtained, buy two or more rations [in the Community stores].”⁷⁸ Another ghetto source noticed that “[i]n the summer of 1944, the price of cigarettes sold by street traders was three times higher than the official

⁷³ Sitarek and Wiatr, op. cit., p. 61.

⁷⁴ *Id.*, p. 144.

⁷⁵ *Ibid.* (italics added).

⁷⁶ *Dobroszycki*, op. cit., p. 360.

⁷⁷ Sitarek and Wiatr, op. cit., p. 157.

⁷⁸ *Dobroszycki*, op. cit., p. 339.

price.”⁷⁹ The table below arranges an assortment of Black Market Premiums (BMPs), calculated as the difference between a good’s official and black market prices. (Note: **green** indicates the good was more expensive on the black market, **red** indicates the good was cheaper on the black market).

Chart VI: A Selection of Black market Premiums (BMPs) in the Łódź Ghetto

Good	Official Price (in GM)	Official Price Date	Black Market Price (in GM)	Black Market Price Date	BMP
Beetroot	0.5	3/7/1941	150	3/3/1941	29,900.00%
Bread	0.9	8/4/1941	20	8/2/1941	2,122.22%
Briquette	0.15	2/7/1944	5	2/12/1944	3,233.33%
Butter	1	9/30/1943	950	9/20/1943	94,900.00%
Cabbage	0.6	7/28/1943	7	7/28/1943	1,066.67%
Canned Meat	1.5	3/12/1944	850	3/15/1944	56,566.67%
Carrots	0.5	3/7/1941	150	3/3/1941	29,900.00%
Cigarette	1	5/23/1942	2.5	5/23/1942	150.00%
Coal	0.066	1/13/1941	2	1/12/1941	2,930.30%
Coffee	2.4	3/7/1941	1.4	3/7/1941	-41.67%
Flour	0.44	3/7/1941	9	3/7/1941	1,945.45%
Kasha	0.13	1/20/1941	13	1/20/1941	9,900.00%

⁷⁹ Sitarek and Wiatr, op. cit., p. 204.

Margarine	7	5/8/1943	9	5/5/1943	28.57%
Matches	0.15	1/19/1943	3	1/18/1943	1,900.00%
Potatoes	0.5	2/12/1944	180	2/12/1944	35,900.00%
Radish	0.5	1/29/1944	35	1/28/1944	6,900.00%
Rutabaga	0.4	3/7/1941	1.4	3/7/1941	250.00%
Rye Flour	0.7	10/6/1943	150	10/6/1943	21,328.57%
Soap	0.4	10/6/1943	4	10/6/1943	900.00%
Sugar	1.8	10/6/1943	180	10/6/1943	9,900.00%
Wood	0.33	11/12/1943	3.5	11/6/1943	960.61%

III. Conclusion

The diaries left by Łódź Ghetto prisoners are so jampacked with black market data that the 1984 English edition of the *Ghetto Chronicle* excised “elements that might be considered monotonously repetitive....[like] prices on the black market.”⁸⁰ But to the chroniclers, and to other Łódź Ghetto residents, keeping track of prices and inflation was anything but monotonous. It was the key to survival. And it’s why they recorded them so fastidiously. Indeed, hungry ghetto eyes fixated on prices, currencies, and inflation: “[The currency] devaluation[,]” a 1942 *Chronicle* entry noted, “has a depressing influence... no one can rest easy when he finds that his monthly earnings are equal to the cost of a few loaves of bread. If only for morale and the need to maintain the currency’s value at an appropriate level[.]”⁸¹ Black market prices, the *Chronicle* asserted, “do[] possess great significance in the life of the society (devaluation of the currency).”⁸² In fact, Łódź Ghetto survivors interviewed for this paper still recall black market trading and the role it played in the ghetto.

⁸⁰ Dobroszycki, op. cit., pp. lxvi–lxvii.

⁸¹ *Id.*, p. 118.

⁸² *Ibid.*

To properly study the Łódź Ghetto, then, one must know its economy and its inflation. And to do so, the authors agree with the British physicist Lord Kelvin, who remarked in a May 3, 1883 lecture at the Institution of Civil Engineers, that:

[W]hen you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science, whatever the matter may be.⁸³

And this paper’s research accomplishes this feat. It elucidates the economic conditions central to ghetto life, measuring—with numerical exactitude—annual and monthly inflation rates, relative price changes, exchange rates, black market premiums, and the ghettomark’s purchasing power. With this publication, the economic challenges and realities of the Łódź Ghetto are now quantified and can be understood for the very first time.

Appendix

A Note on Reportage

A 2016 article titled *Ghetto and Concentration Camp Money* by the Jewish Virtual Library held that “towards the end of the war” the Łódź Ghetto experienced “hyperinflation” due to the use of coins as fuel.⁸⁴ While it’s true coins were melted down, hyperinflation is a precise term (50% monthly inflation) and must be observed and measured using precise prices and dates. No source is listed supporting the article’s claim, and the vagueness of its phraseology indicates a misapplication of the term ‘hyperinflation’. A review of the available research on the economics and numismatology of the Holocaust makes clear that this paper is the first and only to study the inflation of the Łódź Ghetto in a scientific manner.

⁸³ Thomson, Sir William. *Popular Lectures and Addresses*. Vol. 1, New York, MacMillan & Co., 1889, pp. 73–74, archive.org/details/popularlecturesa01kelvuoft/page/72/mode/2up.

⁸⁴ Natale, Marisa. “Ghetto & Concentration Camp Money.” *Jewish Virtual Library*, 6 Jan. 2016, www.jewishvirtuallibrary.org/ghetto-concentration-camp-money.

Survival of the *Chronicle of the Łódź Ghetto*

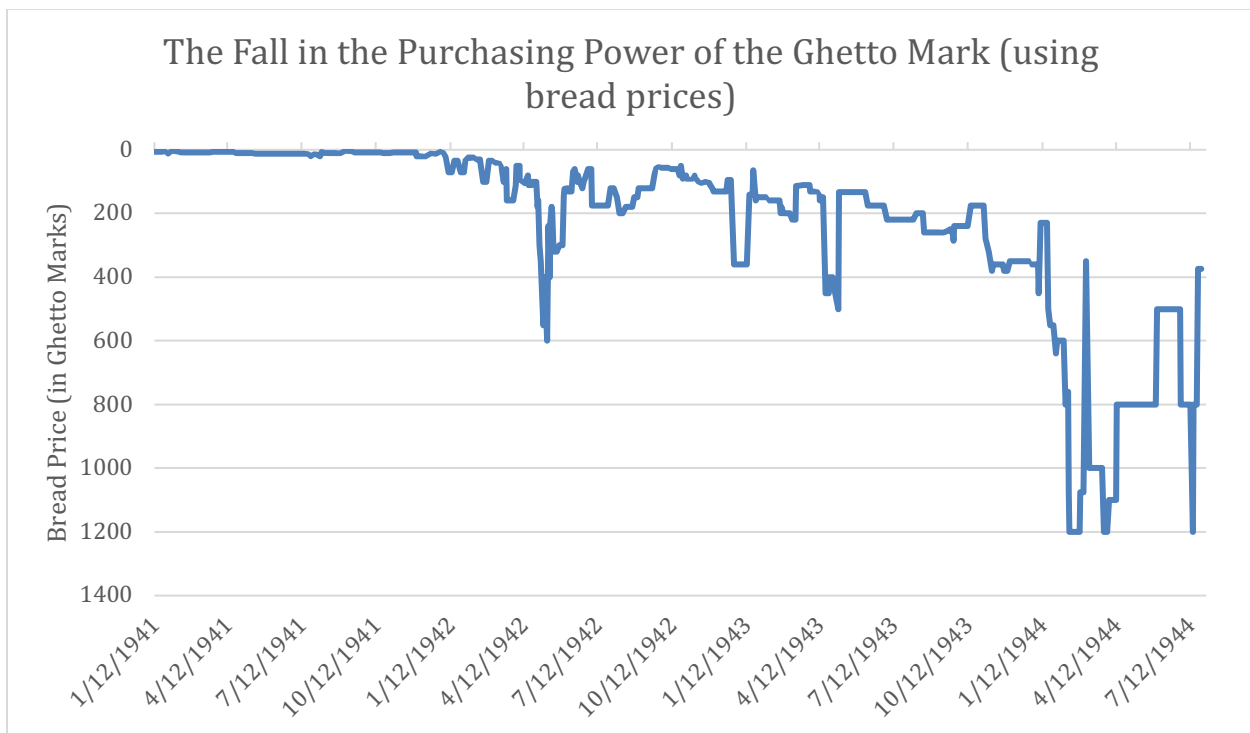
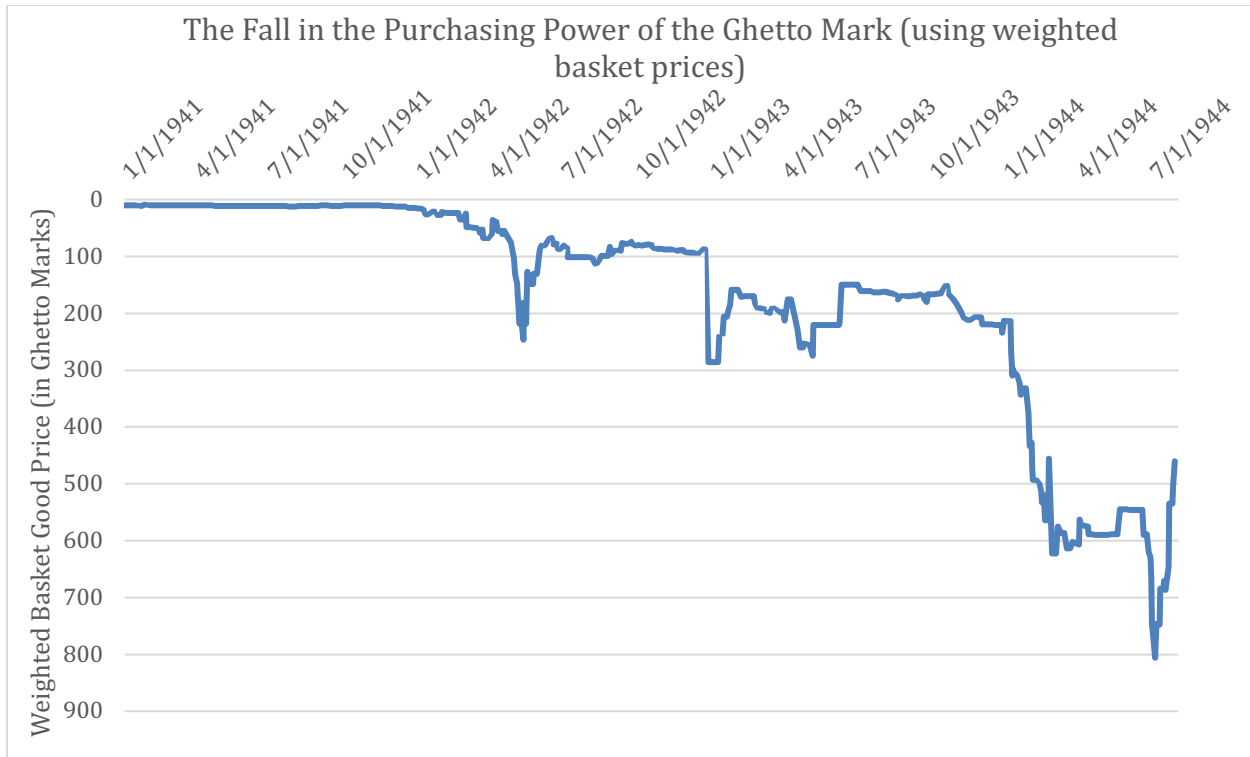
When the Germans liquidated the ghetto at the end of August 1944, they selected some prisoners to remain behind and clean up the area. The Nazis dug graves in the Łódź Jewish cemetery in preparation of shooting the cleaning crew when the job was done. The Germans hastily fled, however, before advancing Russian troops on January 18th, 1945, failing to finish off the murderous task. When the Russians liberated Łódź the next morning, the cleaning crew, plus those who had come out of hiding, numbered 877 persons. Amongst this group were several *Ghetto Chronicle* contributors who had safeguarded the papers. A second batch of papers was unearthed in November 1946 from an underground bunker (see photo below). Members of the cleaning crew buried a third collection of *Chronicle* documents in the Jewish cemetery in September 1944, but the Nazis tracked down the hidden archive and destroyed it. Much of the original *Chronicle* is therefore lost to history. However, the compilation of this data, in such a complete and orderly manner, and the efforts to save it, made this research study possible and stands as a testament to the mettle of ghetto residents.



Discovery of a section of the Ghetto Chronicle, Nov. 1946.

Source: Yad Vashem

Additional Charts



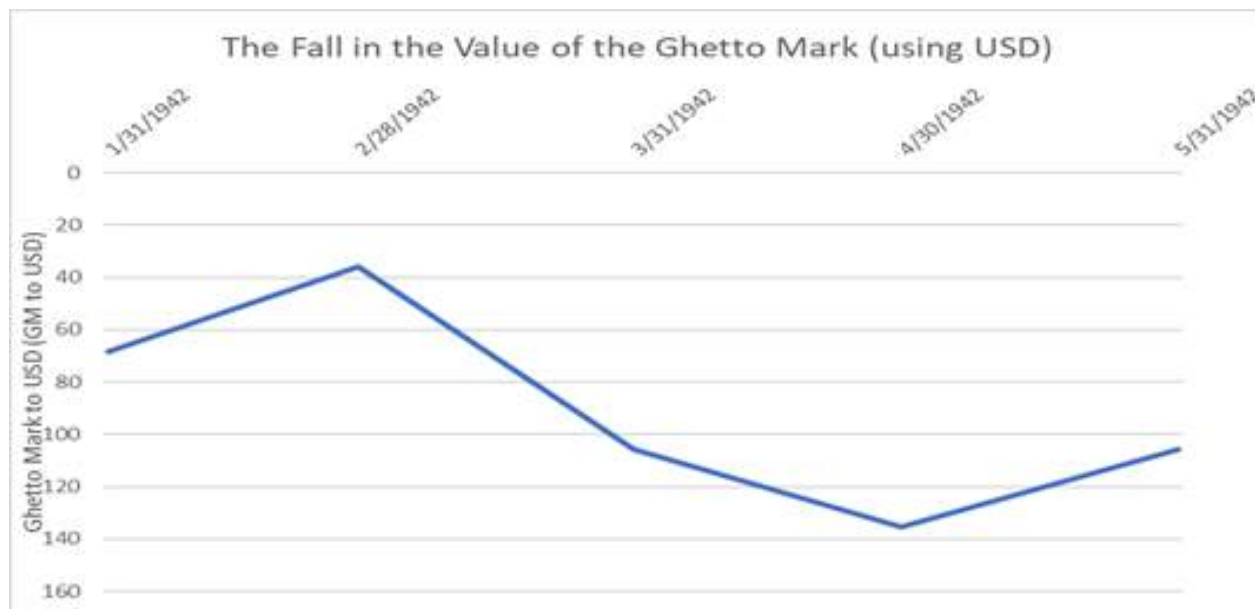






Chart VII: Łódź Ghetto Coins













Denomination	Year	Mintage	Metal	Design	Image
10 Pfenning	1942	100,000	Brass	Obverse: Six-pointed star of David with the date in the center; Der Alteste der Juden in Litzmannstadt imprinted around the rim. Reverse: 10 in center; Quitting uber Pfenning	

				printed around the rim.	
10 Pfenning	1942	Unknown	Bronze	Obverse: Six-pointed star of David with the date in the center; Der Altteste der Juden in Litzmannstadt imprinted around the rim. Reverse: 10 in center; Quitting uber Pfenning printed around the rim.	
5 Mark	1943	600,000	Aluminum	The 5, 10 and 20 Mark coins had the same design, except for the values.	
5 Mark	1943	restrike	Aluminum Magnesium	The 5, 10 and 20 Mark coins had the same	

				design, except for the values.	
10 Mark	1943	100,000	Aluminum Magnesium	The 5, 10 and 20 Mark coins had the same design, except for the values.	
10 Mark	1943	restrike	Aluminum Magnesium	The 5, 10 and 20 Mark coins had the same design, except for the values.	
20 Mark	1943	600	Aluminum	The 5, 10 and 20 Mark coins had the same design, except for the values.	

Chart VIII: Łódź Ghetto Banknotes

Denomination	Issue Year	Availability	Obverse	Reverse
50 Pfenning	1940	Common		
1 Mark	1940	Common		

1 Mark	1940	Common		
2 Mark	1940	Rare		
5 Mark	1940	Rare		
10 Mark	1940	Rare		
20 Mark	1940	Common		
50 Mark	1940	Rare		



Reverse and observe sides of a 1-mark ghettomark (courtesy of the private collection of one of the authors (Blustein))

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