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Inflation without politics: how French prices outsmarted bullets, 1938-1949

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Inflation without politics: how French prices outsmarted bullets, 1938-1949

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Abstract

This article addresses the growing gap between qualitative data on prices and money in France around World War II, and the available CPI. It gathers archival price data to calculate a new CPI for 1938-1949, incorporating both official and black-market prices. The study demonstrates the adequacy of available sources and the robustness of the new CPI, both in its construction and when compared to contemporary analyses. Three key findings are that France did not experience exponential price acceleration; that dictatorship (1940-1944) was no more effective at price control than democracy (1945-1949); and that the 1944-1945 wage increases had a minor impact on inflation, questioning the price-wage loop explanation of France's post-war inflation.

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Inflation without politics:

how French prices outsmarted bullets, 1938-1949

“Inflation in a ‘vacuum’ does not have the effects of inflation in a free market. This is true on condition that the markets (products-wages-exchange) are completely closed. This is even true to a certain extent when the product market is connected, through a back door, with a clandestine or black market. Provided, however, that the back door is not, like the gates of hell, wide open to sinners.”

Noyelle (1945)

Introduction

Since the early 1930s, macroeconomics has provided social scientists and governments with excellent tools to assess and forecast the complex economics effects of political decisions, whether they be budgetary, monetary, social or legal. However, every benefit comes at a cost. In the case of macroeconomics, that cost is the gathering, processing and evaluating of large amounts of data, along with the continual assessment of the methodologies employed and the biases associated. Data related to prices, quantities and qualities are the most important, as they form the basis for almost all macroeconomic computations and allow for consistent comparisons. The practical value of such extensive data would indeed be limited if it were impossible to compare key figures across different times or spaces, for example to assess the purchasing power of a given sum of money in a specific context at a particular date.

This issue is especially relevant in troubled times. When “inflation” or “inequality” increases, when production shifts, or when entire sectors face crises, tracking changes in key figures, i.e. prices, quantities and qualities, becomes both more critical and more challenging. The spike in inflation that followed the Covid-19 crisis, which remains the subject of heated political and academic debate, illustrates this issue and its complexity (Mandelman, 2021). The contrast between the Eurozone, Japan and the U.S., shows that local circumstances may explain differing policy responses to inflation, but uncertainties related to price dynamics also play a role. This is precisely what FED’s president Jerome H. Powell declared at the 2023 Jackson Hole Conference, “As is often the case, we are navigating by the stars under cloudy skies¹.”

It would seem sensible for statisticians, economists and public officials to devote more time and energy to building rock-solid macroeconomic series during difficult times, to better understand the nature of the problems and design adequate solutions. Simultaneously, it is during crises that such statistical endeavors are the most challenging to implement, either because the changing nature of the parameters to follow calls for new methods and data, or because the actual conditions hinder the gathering and processing of the data. As expressed by INSEE, the French public statistical board, following the Second World War (WW2): “Unfortunately, the very circumstances that made these surveys necessary made it impossible to carry them out on a large scale.” (INSEE 1947, p. 7)

French history during and after World War II (WW2) presents a good example of such challenges. Following a crushing defeat against Nazi armies in 1940, a whole new administration for price control was created (Mouré 2023) (Grenard 2008), and

¹ “Inflation: Progress and the Path Ahead”, Jerome H. Powell, Jackson Hole Symposium, August 25th, 2023.

comprehensive lists of official prices were published weekly up to 1951 in the *Bulletin officiel des services des prix*² and used to build price indices. With the new bureaucracy came new powers to set, investigate and repress price divergence from the official “*prix taxés*” (State controlled prices).

However, as strange as it may sound, this period is also the one over the last 100 years when the quality of the French price series, and consequently of all other macroeconomic series, was the most deficient. At a time when over a third of French urban households’ food consumption was made of black or grey market purchases, “only official prices have been taken into account when calculating the indices³”.

INSEE⁴ was and still is very well aware of the issue, to the extent that monthly indices, although calculated during the period, have not been published in the retrospective statistical yearbooks since 1960. Only yearly data points are provided in recent yearbooks, but, as we shall see, they do not offer a much more reliable basis for economic or historical analysis. Nevertheless, the consequences remain dire: what meaning can most macroeconomic series, ranging from GDP to public debt, real wages to currency value on exchange markets, hold if inflation is merely a vague guess?

The purpose of this article is thus threefold: firstly, to demonstrate the poor quality of the official price series and how it has led to incorrect narratives about the period; secondly, to propose an alternative index and reconcile it with contemporary accounts; and thirdly, to

² The *Bulletin* was published until 1980, under a different name after 1951. Its role after 1951 was less about stating official prices and more about market competition, consumption and fraud enforcement.

³ French National Archives, 20000115/14, Letter from André Vincent to Alfred Sauvy, December 1959.

⁴ INSEE: the “*Institut national de la statistique et des études économiques*” (National Institute for Statistics and Economic Studies) was founded in 1946, through the merger of several statistical bureaus, including the *Service national des statistiques*, itself the result of a 1940 merger between the *Statistique Générale de la France* and other specialized statistical offices, with the economic studies and documentation services of the Ministry of the National Economy. This flurry of mergers and reorganizations testifies to the importance of data gathering and processing during this very troubled period.

reveal how the new index provides fresh insights into the 1938-1949 period. However, for the sake of brevity, we have chosen not to address monetary issues in this article but will cover them in future publications.

To achieve these three objectives, we will start by describing the available data and its severe limitations, which have misled many commentators and researchers, creating historical myths. These myths include the supposed post-war price acceleration, the relative efficiency of dictatorship repression over democracy and freedom in fighting inflation, and the wage-price causality in fuelling post-1945 inflation (part 1). Challenging these narratives, we will construct our database step-by-step to demonstrate the robustness of our methodology in assessing the impact of black markets on price dynamics (part 2). This approach will allow us to use black and grey prices gathered from archives and publications to develop a general consumer price index for Paris (part 3). The new quarterly price series will enable us to better track the CPI at a time of massive monetary expansion and market disruptions, aligning more closely with contemporary insights (part 4). Finally, we will discuss the implications of the new series for the French historical narrative on prices, price policy, and wages, and propose several avenues for future research (part 5).

Inflation in a French context: a *disappearing number*⁵

Wanting series, missing data

This article focuses on French prices during the 1938-1949 period. 1938 was the last year before war and can thus provide us with a base year for further comparisons. 1949 is the first year without full-rationing. Although most rationing rules were lifted by July 1949 (main harvest period), the price control legal framework (*ordonnances sur les prix*) remained in place until 1986. Many “sensitive” prices, such as bread, coffee, or veal, remained under state control at least until the mid-1950s. For instance, bread prices were state-regulated until 1978, and were only fully subject to market forces starting 1987, ending a practice that dates back to at least the 13th century (Kaplan, 2008). Due to these price controls, unofficial transactions and prices emerged during those years, which were not included into the official price indices. These are often referred to as “black market” prices, though they were not true markets in the economic sense. Thus, the following discussion will address “black prices” rather than “black market prices,” as the latter term is a misnomer. Unlike the indices immediately preceding or following 1938 and 1949, the official price indices include only a fraction of the actual transactions and prices (See Online Appendix 2). It is also notable that from 1953 to 1958, the French government engaged in a policy known as the “*politique de l’indice*” (index policy). This involved funding or taxing products that had the most influence on the CPI index to delay automatic wage increases triggered by rising prices⁶.

⁵ A tribute to the fantastic show by Simon McBurney.

⁶ Jean-Michel Rempp, *L'expérience française des indices de prix à la consommation*, INSEE, F9608, p. 6, https://www.INSEE.fr/fr/metadonnees/source/fichier/ipc_experience_francaise.pdf and Touchelay, Béatrice.

The 1938-1949 period can be divided into several overlapping, sub-periods (Table 1). This overlapping of different periods, based on military and political events, is a crucial element in the analysis. It will be used to question the validity of various breaking points and propose a more comprehensive outline of the price dynamic and monetary history of the period. According to most authors, political and military events were the primary cause of the high inflation during these years, because of logistical disruptions (both internationally and internally), reduced output, and military plundering, all which resulted in massive supply shortages.

Table 1 – General chronology, 1938-1949

General periodization	French political timeline	Main events (as seen from France)	Economic events
1939-1945 WW2 in Europe	1875-1940 Third Republic	1938 Munich	1938 inflation peak
	1940-1944 Vichy Regime	May-June 1940: battle of France and defeat	1939-1940 Implementation of rationing policies
		June 1940 Birth of Resistance	Sept 1940 Beginning of black markets
		Nov. 1942 Nazi occupation of Southern France	1941 Generalization of shortages and black markets
		1943 CFLN (French Committee for National Liberation)	1943 Maximum extension of looting and black markets
	1944-1945 GPRF Regime	1944 Allied Forces landings (June 6; Aug 15)	1944 General disruptions of transports and supply chains
1945 V-Day in Europe		1945 short-lived benefits of Lend-lease agreements (rescinded Aug. 1945)	
1945-1947 United Nations peace in Europe	1945-1947 (constituent) National Assembly Regime	1946 (official) starting point of colonial wars De Gaulle exits French government	1944/48 Demise of French Franc and scramble for external funding
1947-1949 Cold war inception	1947-1958 Fourth Republic	1947 End of “Tripartisme” (political alliance between communists, socialists and centrists)	1947/48 Marshall Plan (ERP)
			1949 Inflation cools off and GDP is back to 1938 levels

“La fabuleuse histoire de l’indice des prix de détail en France”, *Entreprises et histoire*, vol. 79, no. 2, 2015, pp. 135-146, p. 138-139, <https://doi-org.faraway.parisnanterre.fr/10.3917/eh.079.0135>

A secondary cause was monetary policy, particularly the significant and parallel increase in public debt and money supply. These two causes can be combined into a single narrative, supported by Figures 1 and 2, and that we could summarize as follow:

In an overall inflationary situation, with money issuance growing far beyond the shrinking supply of goods and services, prices increased steadily but moderately during the war and occupation (1940-1944) and accelerated after 1944 until the stabilization in 1949. The reasons behind this acceleration include the suppression of market control policies enforced at gunpoint and the accompanying financial repression policy. These were replaced by more accommodating policies that allowed for long-delayed wage and price increases, which were eagerly anticipated by a deeply impoverished but newly enfranchised population. In technical terms, the Vichy administration, particularly Yves Bouthillier, claimed that the massive over-issue of fiduciary and scriptural money had been “sterilized” during the war and occupation period through a “circuit policy” involving massive savings accumulation in treasury bonds. Thus, the money supply supposedly did not worsen the shortage-based inflation of 1940-1944. The end of German occupation also reduced the capacity to repress economic behaviors in the new democratic context. This was especially significant at a time when over 75% of the votes were directed towards three left-leaning political parties (PCF, SFIO and MRP) whose top-priority was to improve daily living conditions. This “politique de facilité” (make-it-easy policy) unsurprisingly led to a wage-price spiral, often associated with the Palais Royal Conference on wages in July 1946⁷.

⁷ The exact name being the “conférence nationale économique du Palais-Royal sur l'aménagement des salaires et des prix”.

Figure 1. French official monthly prices indices, 1938-1950

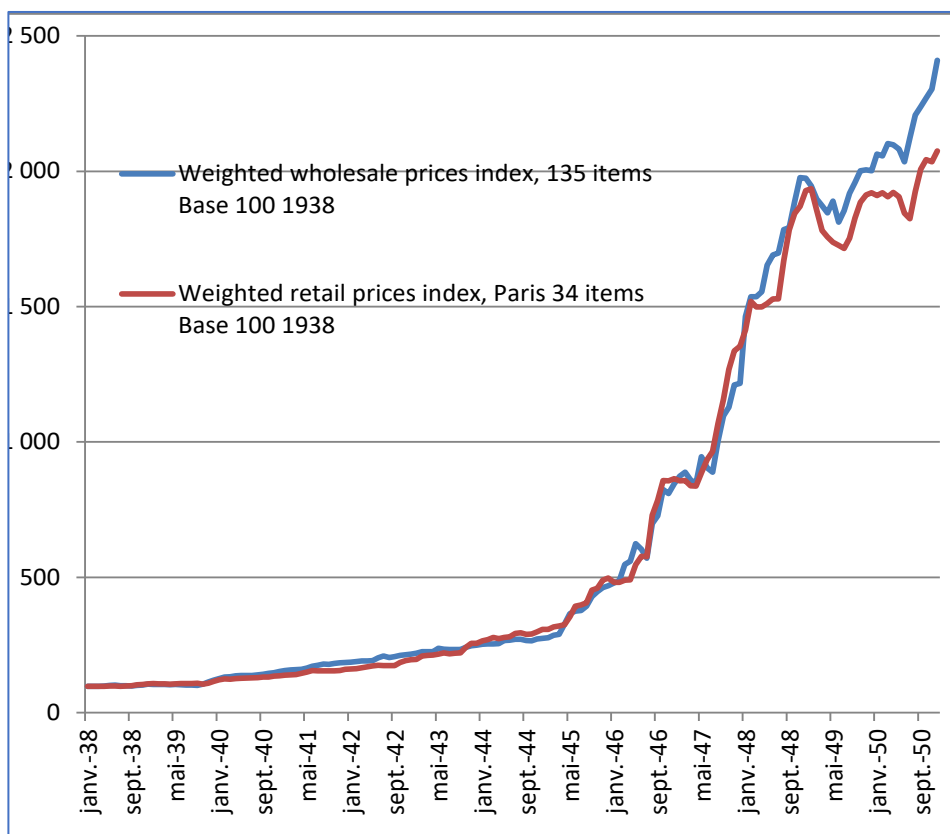
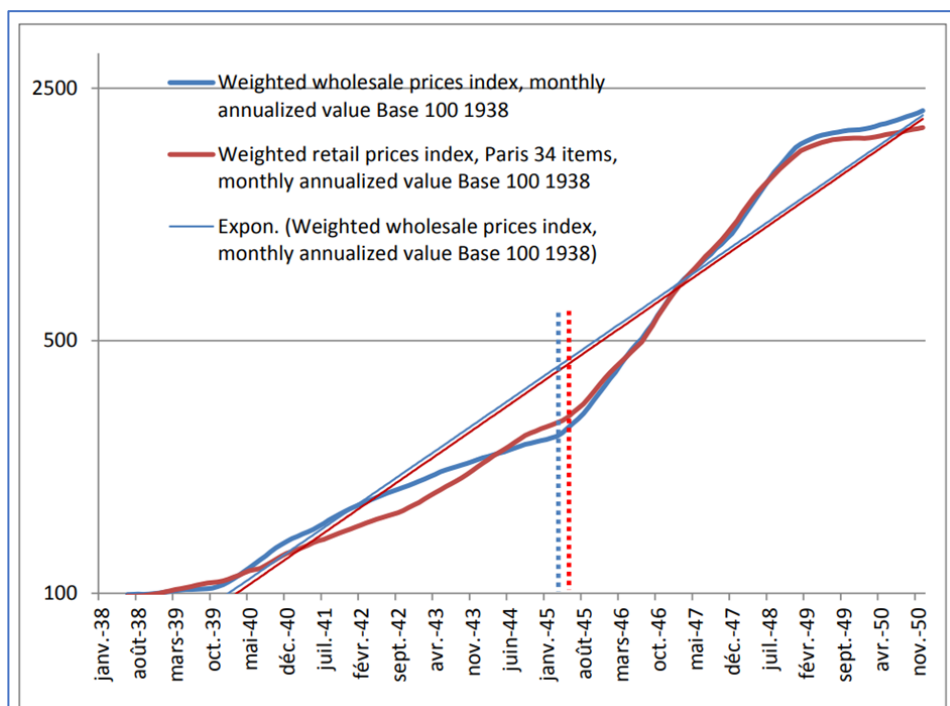


Figure 2. French official monthly prices indices, 1938-1950: the 1945 acceleration



Caption: Dotted vertical lines represent the maximum gap between the actual curves and their exponential adjustments, marking the accelerating point of both curves

Kenneth Mouré, who recently published a comprehensive history of French black markets during WW2, notes first that:

“Bank of France managers noted repeatedly that rising prices were not recorded well in official price indices. The manager in Roubaix observed in February 1942 that the widespread practice of under-the-table payments (souttes) increased the real prices paid. ‘There’s no longer any correlation between the official accounts and business as it is actually transacted’. In March, the Bank explained, ‘in all branches of the economy, we see an extreme disorder in prices, which makes it impossible now to calculate any valid index or to determine what used to be called the level of the cost of living.’” (Mouré, 2023: 32)

But a few pages later he concludes:

“Retail price inflation (official prices in Paris) was held under 20 per cent per year from 1940 through 1942, surged to 38 per cent in 1943, and would reach 60 per cent annually from 1946 through 1948 (table 3.2).” [Mouré, 48] “The price controls did restrain inflation during the Occupation. The CE agents, liked or more often not, were present in markets to enforce price discipline and did so with visible success (see Table 3.2).” (Mouré, 2023: 59)

A comparable statement regarding a pre- versus post-Liberation perspective on inflation is found in Grenard’s work. Grenard observes that black market prices reached unprecedented levels in the spring of 1944, despite continued growth in subsequent years (Grenard, 2008: 481). If, as the initial quotation suggests, “real prices” were “increased” by black markets, can we be certain that inflation accelerated from 28% in 1943 to 60% in 1946? Consequently, what would be the impact of revising the price index on both the historical narrative and the economic history of the period from 1938 to 1949?

The challenge of reconciling qualitative accounts with unreliable price indices and official figures exemplifies the problems stemming from the lack of a reliable price series. In this regard, our quantitative results actually support the qualitative analyses of Grenard and Mouré, which are in so many ways at odds with the official indices. The absence of a statistically comprehensive and empirically meaningful series leads to a rather confused understanding of price dynamics. In a politically unstable context characterized by high inflation, issues such as standards of living, caloric intake levels, public debt, and foreign exchange constraints cannot be adequately addressed without a clear understanding of price dynamics.

Moreover, the dominant discourse supports conclusions that remain highly problematic today: first, that authoritarian regimes are better equipped to curb inflation; and second, that wage increases are the main driver of inflationary dynamics.

[The available price series, their meaning](#)

The history of French price indices highlights some of the persistent difficulties in obtaining valid data for the 1938-1949 period (see Online Appendix 1).

From Figures 1 and 2, several conclusions can be drawn. Firstly, official prices continuously accelerated over the period until 1949, with the growth of prices up to 1948 being faster than exponential. Secondly, the main acceleration for both wholesale and consumer price indices occurred around March 1945, after the French territory was nearly entirely liberated from German occupation and looting. This coincided with significant wage increases in the summer of 1944 and the spring and fall of 1945. Basing his analysis on the

comparison between total annual French wages and the official price index, Chélini concludes: “The high level of this ratio [of wages to prices], limited to the two years 1944 and 1945, significantly contributed to the inflationary outbreak in the spring of 1945⁸”. Lastly, both indices, wholesale and consumer, present very similar profiles between 1938 and 1948, with a divergence appearing only in 1949. This last conclusion is crucial: to our knowledge, no collection of wholesale black prices has survived in the central archives, so we can only track retail black prices. This would make our price study impossible or irrelevant if wholesale and retail official price indices were strongly divergent. Since this is not the case, we believe that studying the CPI allows us to draw general lessons on French inflation between 1938 and 1949, even though we track prices only in Paris, in order to mimic the official price index.

“The reasonable case for a new price series based on purchasing power”: three steps to build a new history of prices

A qualitative model of French prices dynamics

As is evident from the discussion above, a general model of inflationary dynamics is necessary to clearly establish our hypotheses, rather than relying solely on data and sources for all our analyses.

Our main hypotheses can be summarized as in Figure 3. Firstly, as shown in Figures 1 and 2, official prices followed a more than exponential trend throughout the period. This trajectory suggests a hyperinflation situation, and the fact a full-blown hyperinflation crisis

⁸ P.-M. Chélini, *État et opinion en France*, IV.3, parag. 123, <https://books.openedition.org/igpde/2568#bodyftn109> Original quotation : « Le haut niveau de ce rapport, limité aux deux années 1944 et 1945 n’est pas pour rien dans le déclenchement inflationniste du printemps 1945. »

never occurred in France is not adequately explained in the literature. Secondly, tolerated grey prices (family parcels⁹) and free prices (when fixed prices co-existed with non-repressed free markets, as was common after 1947) consistently remained higher than official prices once price and quantity regulations were enforced in the summer of 1940. These prices increased more rapidly than official prices because they were not constrained by political decisions and were driven by both shortages and a rapidly increasing money supply. Thirdly, black prices quickly diverged from official prices, although they remained somewhat related to grey prices. The key issue with these black prices is their weight within the family food budget: given their high price level, they could account for only a small fraction of total consumption, except for staples that entirely disappeared from shelves, such as coffee or chocolate. Although black markets might represent close to 100% of the consumption of these staples, actual consumption was low as most Parisian households were priced out. The fact that any staple could be bought on the black market if the price was high enough should not be seen as proof of an “untapped” abundance (Sauvy, 1978), but rather as evidence of a very severe shortage, albeit a socially unequal one. To address this issue, we adopt a streamlined protocol based on general assumptions about the quantities provided by the three segments – official, grey and black markets – to the average Parisian household.

The coexistence of such disparate prices – still evident in the data for meat prices in 1948 – highlights a crucial characteristic of prices during this period: there was no longer a “national market”, or even markets in the economic sense of the term. This means that the

⁹ Since official rations did not cover the minimum daily caloric intake, authorities authorized “family parcels”, i.e. food parcels sent from the countryside to city-dwellers, with the added benefit of reduced shipping costs. The number of parcels soared tremendously during the war, alleviating much suffering in the cities, see Sauvy, Grenard and Mouré.

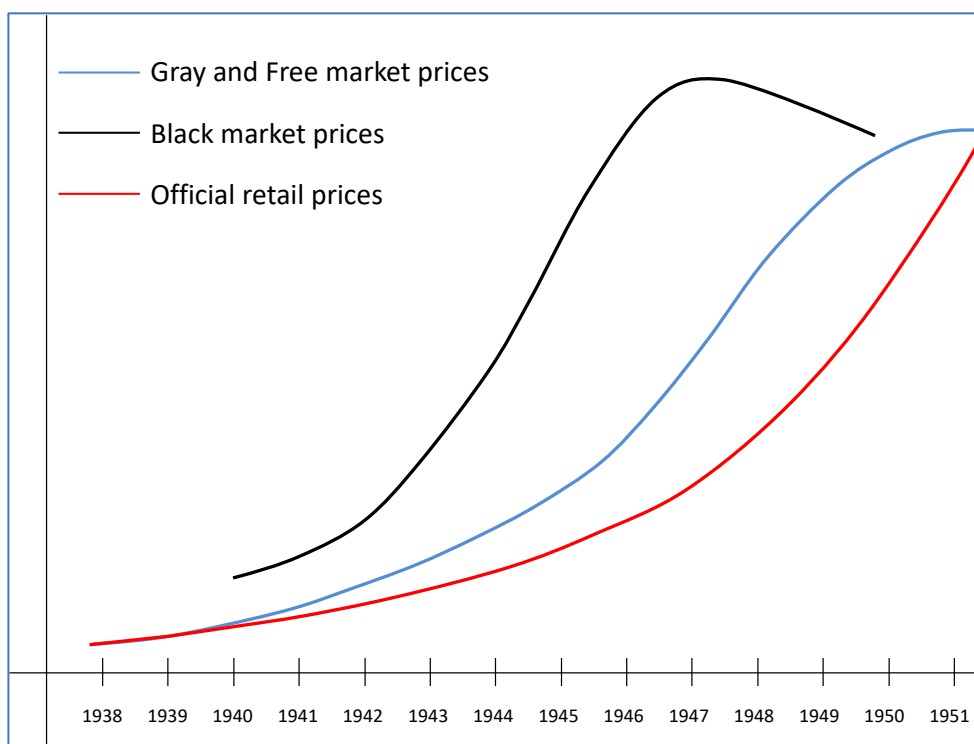
usual information-led arbitrage between places, periods and staples did not function as they typically do in a market economy. The law of one price did not apply anymore, and France was fragmented into a myriad of locally and socially layered bargaining nodes based on private networks, wealth, location, family ties (notably to the countryside), and occupation (with firm canteens playing an outsized role in Paris). However our researches show that prices are locally homogeneous when they are observed on a similar kind of transaction (See Online Appendix 3).

The breakdown of usual market mechanisms was reflected in the price dispersion between legal, tolerated and illegal markets, as well as within the black markets or from one period or place to the other. Consequently, the restoration of a full-fledged market economy would lead, all other things being equal, to the convergence of white, grey and black prices. This could result in short-lived but significant price hikes for the freed prices and/or a decrease in black prices. Prices were also less constrained by cash availability due to the huge increase in monetary circulation, particularly for the most affluent segment of the population. That is why all prices and markets categories should be understood as a continuum with no clear-cut distinctions. An official price, due to recurring shortages, could become a “privilege” for the few who could afford it through services or bribes (*“dessous de table”*), while an “amicable” price could approximate the actual production cost and offer a normal quality level not available at the official price. This aligns with the explanations provided by statisticians of the time:

It should also be noted that the retail price index for 34 items gradually ceases to relate exclusively to regulated retail prices, as the sale of a given product becomes freer, and a free price more or less similar to that previously charged on the parallel market is substituted for the taxed price. As a result, the upward movement shown by the indices

can be attributed in part to this substitution, and does not necessarily correspond in its entirety to a price increase that has actually taken place¹⁰.

Figure 3. A General sketch of the French inflation dynamics, 1938-1950



In the following sections, we will not attempt to weigh the six main causes of French inflation identified in the literature: over-issuance of money, flight from currency, shortages, production decline, productivity decline, and grey and black markets. Instead, we assume that there were three primary modes of control over price inflation (i.e. we remain neutral towards which price policy choices were most effective): price taxation (state-fixed prices), quantity regulation (supply rationing), monetary policy (the reduction in the so-called “inflationary gap”).

¹⁰ *Bulletin de la Statistique générale de la France*, 1946, n°7, available on Gallica.

Consequently, our questions are threefold: Is it possible to find enough black prices to build significant series? What weighting coefficients should be used to reconcile black and official prices in the absence of reliable series on the quantities traded on the grey and black markets? What impact would including black prices have on the overall price trends during this period and our assessment of French inflation between 1938 and 1949?

The general limitations of a price index

Because we cannot replicate the high-quality procedures of the official price index, our purpose is modest both in its methods and its scope. We aim to provide researchers with a likely scenario of the trajectory of the purchasing power of money during the 1938-1949 period by approximating the CPI. Our main surprise was that we were actually able to compute this index on a quarterly basis.

Both the issues of quantity and availability are acute for retail prices. When official rations amount to less than 50% of the minimum caloric intake, it is obvious that focusing exclusively on official prices is irrelevant, as escaping legal markets becomes a matter of life and death (see Online Appendix 2, Table A2). Since the French population did not starve to death – except for the tragic case of locked up and incarcerated people, especially in mental institutions (Bultzingsloewen, 2007) – during the war, occupation and post-war periods, this indicates that it was capable of producing or buying more than the official rations (Sauvy, 1978). Given the price constraint, we can also assume that people tended to maximize the proportion of official supplies in their consumptions and then resort to these five possible solutions: consumption reduction (reflected in declines in stature and weight during the period (Sauvy, 1978)), household production, “amicable” transactions (through acquaintances or firm-level

initiatives), substitution (fruit and vegetables were never rationed) and the outright black market. Louis Baudin, a conservative economist, summarized this weighting issue in 1947 (Baudin, 2011):

This value is expressed in terms of goods and services. But what reference should we use? No price level results from the free play of supply and demand. Official prices are obviously too low, as they correspond to taxed prices. Free market prices are too few to be indicative. Black-market prices generally contain elements of monopoly and always a risk premium; moreover, their clandestine nature makes it impossible to have sufficient knowledge of them. Statistics are needed to calculate a weighted average of official, free and black market prices.

Lastly, a key feature of this period is the loss of “moneyness” experienced by cash. On the one hand, most official household items were available only by presenting, in addition to money, rationing tickets, introduced in the Fall of 1940¹¹. On the other hand, the government tried to promote payments by checks. Additionally, the forced exchanges of banknotes from 1945 to 1948 impacted the trustworthiness of fiduciary money, although their significance is more complex (Teixeira, 2023). Conversely, money retained its full medium of exchange power on illegal or free markets, but at a cost: the margin between legal and illegal prices. Inflation was just one of the limits placed on the value of money. The various monetary mechanisms at play would warrant specific research¹². Suffice it to say that for the purchasing power of money to avoid devolving into full-blown, self-reinforcing hyperinflation, some anchoring mechanisms must have played a role, among which black markets were crucial. Without them, the “desirability” of money would have withered, as it did in 1923 Germany or 1948 Hungary,

¹¹ Rationing tickets, building on the experience of WW1, were circulated by the local authorities as soon as June 1940, sometimes against the central government. Their state-led generalization started in late July.

¹² See (Blanc, 2008) and (Lastécouères, 2022).

because they provided money holders with a good reason to hold (and spend) the said money, similar to the situation in the US and the UK where forced savings also reached historical heights (Mandelman, 2021).

A step-by-step process

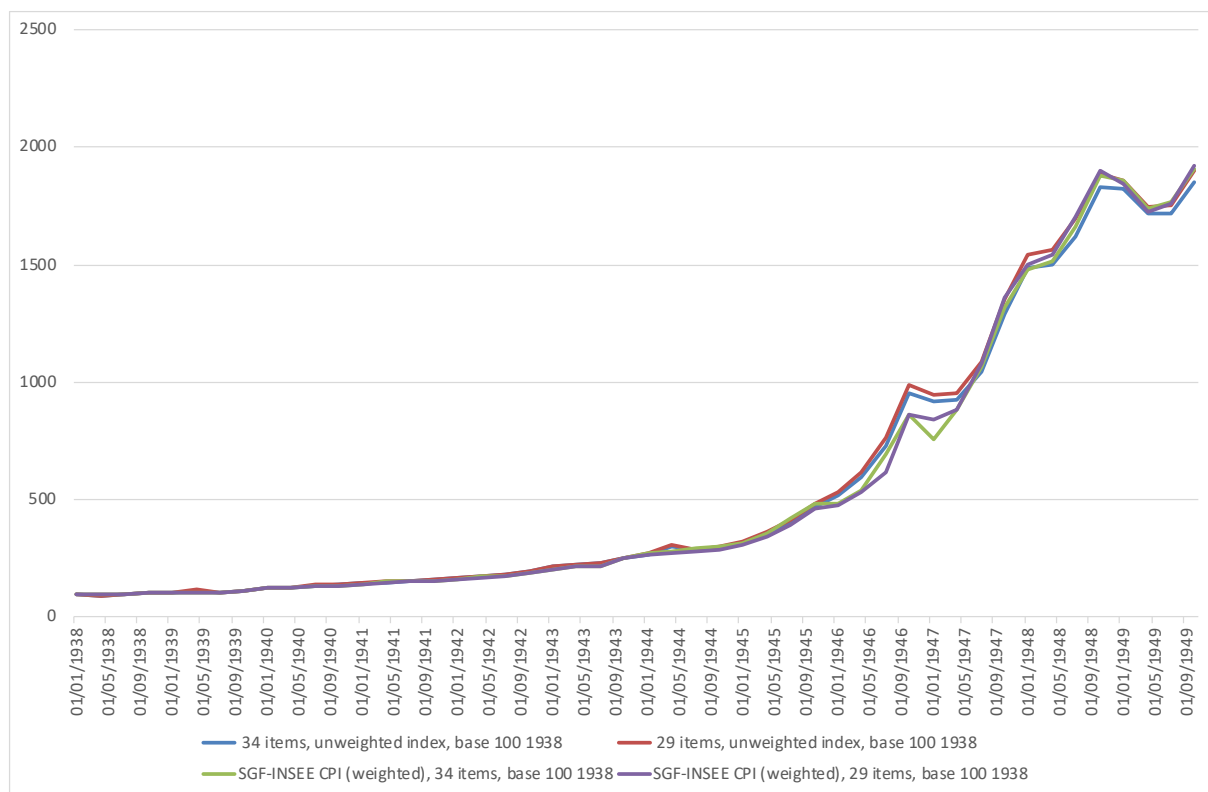
Keeping all the previously exposed biases in mind, the solution we propose consists of building a price series step by step, and then confronting our results with the few comprehensive indices available.

The first step addresses the issue of individual staples' weight: as we have seen, it is difficult to retrieve data on the actual weights of different items in household consumption. This is why we check for the difference between the official weighted retail price indices and an unweighted retail price index built with the same official prices of staples in Paris collected by SGF and INSEE. Figure 4 compares the evolution of the two weighted official price indices with the unweighted official prices of the same items in Paris¹³. The result is very good and unsurprising: in a highly inflationary environment, most prices exhibit a very strong common trend. The four curves are highly correlated (see caption), which means that we can use an unweighted formula to proxy price dynamics over the period. In short, whatever the seasonal and specific movements in weights, their impact was largely superseded by the price dynamic. Thus, it allows us to 1) use this unweighted index as a proxy for price movements and 2) to enrich our indices with black and grey prices. The question that remains, though, is the

¹³ The published list of retail prices includes 49 products, but since prices for date fruits were missing during our period, 48 products were retained in our index.

respective weights of “white”, “grey” and “black” prices. Building on these results, the next section detail how we proxied the price index to include grey and black prices (3).

Figure 4. Comparison of official and computed 29 and 34 items price indices



Sources: INSEE yearbooks: SGF-INSEE CPI: INSEE computed weighted index; 29 and 34 items: our unweighted computation based on INSEE yearbooks series of individual prices.

Caption: the four curves look pretty much correlated. A simple regression (48 observations) yields a r^2 of 0,9984 for the two 29-items series and a r^2 of 0,9985 for the two 34-items series. Of course, such a high coefficient only establishes that the trend in prices has an overwhelming influence on the behavior of the four series. But since the trend is precisely what we want to analyze, this is very relevant.

Data building: the collection and its limits

Our main goal is to chain pre-1938 and post-1949 official CPIs with a new 1938-1949 one that includes grey and black prices when they impacted prices meaningfully. Black markets were significant from July 1940 until their decline, due to better supply to the French population in terms of quantity, quality and variety, in 1947-1948¹⁴. From 1948 onwards, the black market was only relevant for a few still-rationed products and can be considered negligible by the end of 1948. The challenge we faced was thus to collect black prices in such quantities and qualities as to permit the computation of that index.

After experimenting with various methodologies¹⁵, the solution that appeared to be the most expedient and robust was to gather black prices we could find and use them to compute a “black prices index”. We then merged this with the official prices of similar staples, i.e. the 49 items listed in the SGF/INSEE publications and the 29/34 official CPI. Consequently, we collected over 2,000 grey and black prices in Paris from mid-1940 to mid-1949 in various sources: SGF and INSEE reports, police records, memoirs and individual journals, newspapers, academic publications.

To construct this index, we report prices at specific dates for specific staples and then we compare the proportion of those prices to the official price. From this comparison, we derive the base 100=1938 price index for the given item at the given date. By averaging the

¹⁴ The variety issue is key, as it reduced the need for substitutes, thus alleviating pressures on staples prices that had to respond to several “distinct” demands. For example chicoree, before the war, was demanded as a vegetable and as a complement to coffee. During the war, it progressively replaced all coffee supply, leading to a steep price increase of this otherwise rather disregarded staple. Because coffee was both a tropical item and a foreign currency cost, chicoree prices were regulated well into the 1950s, which is also a testimony to French colonial failure to develop independent farmer crops in its West African colonies during the interwar period.

¹⁵ Online Appendix 2 details two alternative methodologies we tested but discarded.

different indices, we compute a proxy of a black prices index. Accordingly, we consider that, 1) state-fixed prices determined the price-level lower-bound for any given staple or item; 2) black prices set the upper-level; c) “grey” and “free” prices fell somewhere in between. In the absence of more precise data, we consider that the minimum grey price in Paris¹⁶ is 10% higher than the official price and that the minimum black price is twice the official price.

However, a problem remained: how do we “merge” official prices with free, black and grey ones? An arithmetic average would be meaningless. We needed to determine the respective quantities on black and official markets. To propose an alternative price index to the official one, it is also necessary to account for transactions occurring on the unofficial market and gauge their significance. To achieve this, we estimate the share of illegal transactions in the total transaction volume to consider an official market vs black market weighting, thereby establishing a price index calculated to be closer to the reality experienced by the French during this period (3.2).

Black prices sources: scarcity and reliability

Given the opaque nature of the black market, the quality of the prices we collected varied; some were more credible than others, necessitating a classification of prices based on their reliability. High-quality black prices formed the backbone of the series, supplemented by average prices from other major cities or wholesale prices when gaps occurred. We were able to collect prices for most of the food items composing the official CPI (29 articles), except salted cod and table salt, for which we have only a few examples of black prices. But we

¹⁶ The CPI being based on Paris prices, the fact that grey prices could be equivalent to or lower than official prices in the countryside does not contradict our model. A similar perspective is developed and detailed in (Shizume, 2018)

excluded the five non-food items (34 articles CPI) because we do not have data on the proportion of the black market for these¹⁷, with the important exception of coal. We also decided to use some single items to track an entire category, such as beefsteak for beef meat. Consequently, our black price index follows 23 items for which we have information on their black prices. It is supplemented by the free and official prices information we have on the other dix items, which allow us to compute a comprehensive 29 food index, structurally comparable to the 29 items INSEE CPI. It also means that, by construct, our index may underestimate the actual price level.

As for data density, we were able to obtain at least one price per product per quarter throughout the considered period, by mobilizing sources of varying quality. To address the discrepancies in data quality, we relied on SGF's and INSEE's administrative notes preserved in the archives which provide an overview of black markets and prices. These notes often include high quality data on black prices at a given moment, resulting from direct observation and can thus serve as reference points to assess the quality of other sources. For example, the February 1947 surveys allow us to assess black prices consistently in Paris at that time.

Besides SGF and INSEE, other entities produced high quality data, such as the Ministry of Finance, the Ministry of Agriculture, the *Institut National d'Hygiène*, the *Contrôle économique*, and the Bank of France. For example, in March-April 1946, a note from the Bank of France's Department of Studies provided an overview of the black prices level in Paris and its immediate suburbs. The note detailed black prices for both industrial and food products.

¹⁷ It is worth noting, though, that electricity and town gas were both natural and legal monopolies, limiting the scope for black prices, even though their supply was wanting during most of the war and up to 1947 US coal deliveries. Petrol (gasoline) was a very rare item until 1945, and its price remained heavily regulated afterward. We cannot rule out a black market here, but only a slight fraction of the population would have participated into it, as most cars, which were still relatively rare, were either useless or seized by the authorities, be they French or German.

The *Contrôle économique* was responsible for enforcing France's price legislation. Its reports and official records are invaluable in showcasing the diversity of black markets mechanisms, ranging from strategies to evade control to the variety of products traded illegally. They contain black prices, though their reliability may vary. We focused mostly on reports by agents from the *Contrôle économique* upon the discovery of illicit activities. The agents logged the date of the operation and drafted a summary, often rich in detail, about the circumstances of the apprehension, the initial findings of the investigation, the questioning of those arrested, and sometimes witness statements (Grenard, 2008) (Mouré, 2023). Thus, in instances of caught-in-the-act offences, the report's date provides concrete evidence that a particular item was being sold at a specific price at a given time.

But in many cases, the price remained dissimulated and the inspectors had to question the apprehended individuals to estimate it. But these individuals were strongly incited to understate the transaction prices, as the severity of the penalty could vary significantly depending on whether his/her actions were classified under family provisioning or black-market activities. The practice of family provisioning was so widespread that the Vichy regime recognized the political risk of penalizing nearly the entire population. Therefore, both the legislation¹⁸ and the propaganda clearly distinguished between family provisioning, deemed acceptable, and black-market speculators, who were often labelled as anti-French.

An example of this downplaying behaviour is provided by a report from November 15, 1943¹⁹. An investigation begins following a tip-off “from a trustworthy person, known to us and wishing to remain anonymous, that individuals were offering a certain quantity of honey

¹⁸ This propaganda is reflected in the laws enacted by Vichy: "Revisions to the legislation on the black market and its enforcement in 1942 made a distinction between minor daily infractions, mostly due to the need to adapt to shortages and feed one's family, and significant trafficking" (Mouré, 2020: 274).

¹⁹ Archives Economiques et Financières. B-49559

for sale at illicit prices and without an invoice”. This tip-off led to successive arrests, but most notably, a red-handed sale to *Contrôle économique* agents (who had posed as buyers) of 5 tons of honey at the illicit price of 270 francs per kilo. This initial arrest led to the gradual apprehension of accomplices. The interrogation of one of them illustrated the traffickers’ habit of downplaying their selling prices. Not yet informed of his accomplices’ arrest, the unfortunately named Delaloy²⁰ defended himself, “I assure you that towards the end of October, I sold him 333 kg of honey at 80 francs per kg. I affirm I have told the whole truth and have nothing to add”. This price declared, close to the legal one, was a way of minimizing the sentence he faced. Unfortunately for him, the arrest of his accomplices made his position untenable, and he later revised his statement: “It is true that earlier, if I declared I sold my honey at the price of 80 francs, I was not telling the truth. In reality, I sold it to Mr. Sicot at the price of 150 francs per kg”. INSEE, a few years later, thus advised us “the utmost caution” when using prices recorded by *Contrôle économique*, as it “generally only collects erroneous statements from offenders” (INSEE, 1947:26).

To further increase the number of black prices for our index, we utilized one last source: newspapers. While newspapers did not typically report on black market or black prices directly due to their illegal nature, they did published news about the repression of trafficking that sometimes included information on black prices. Thus, we find both significant black-market cases and individual incidents quoting prices. The great advantage of this source is its relative ease of access. Thanks to Retronews and Gallica, it is possible to conduct keyword searches in vast databases. Across all the newspapers reviewed, 68 provided at least one black

²⁰ The name Delaloy can be read as “de la loi”, which means “of the law”.

market price (see Online Appendix 4). However, these prices are not always reliable because they often come from defendants' statements to the court trying them.

In our ongoing effort to increase the number of data points available, we have also considered other types of prices, which we would classify as lower quality. Indeed, the criteria we set—black retail prices in Paris—sometimes proved too restrictive, and we have compiled a considerable amount of prices that only partially meet this description: wholesale black prices in Paris, friendly retail prices in Paris, and finally, black retail prices in other major French cities. These cities include, for example, Bordeaux, Marseille, Lyon, Toulouse, and Lille. Black prices are not identical in every city since they primarily depend on each major city's local conditions, but they clearly exhibited the same trends, with a structurally high demand on the non-rationed market, leading to relatively high black prices. Marseille²¹, for instance, experienced higher prices than Paris. Therefore, we consider that a price for ham in Lyon or Marseille, for example, can roughly approximate the price level in Paris in the absence of a better source. Similarly, a wholesale black price or a more or less friendly price can give us indications, often even more approximate, of the retail price levels in Paris.

To compile our price index, we have ranked the prices as follows. First come high-quality market prices form the backbone of our series. In the event of a gap in our series, we fill it with the average of one or more prices from a major city, or, if applicable, one or more wholesale prices.

²¹ Provence in general was very severely affected by food shortages, not having been self-sufficient in that regard for centuries. It is likely that Provence city dwellers (Marseille, Toulon, Nice, Cannes) were the most severely affected in terms of caloric intake availability in France.

Estimating the Weight of Illicit Transactions: A Proposed Method

Determining the proportion of products heading to the black market versus those on the official market is essential to truly understand the scale of the black market and the impact that black prices could have on the general level of prices. To make this estimate, we rely on three different series of surveys to obtain an estimation of Parisian legal and illegal food supplies: those conducted by the *Société Scientifique d'Hygiène Alimentaire* (SSHA), those about rationing in Paris, and a 1944 one from *Service National des Statistiques* (SNS).

The SSHA's survey service on nutrition was led by Lucie Randoin and had strong ties with the *Institut National d'Hygiène* (INH), established in 1941 and headed by André Chevallier. The institute's goal was to conduct public health surveys in France, with a particular section dedicated to nutrition. The aim of these studies was to assess the food consumption of the French, their deficiencies, and ways to improve their supplies. Lucie Randoin conducted specific studies among the Parisian population to evaluate their average consumption and identify the main shortages. These surveys were conducted monthly from January 1945 to the end of 1948. A sample of families were given a ledger, which had to be filled out with all the family's consumption over the week (see figure 5).

Figure 5. An example of the surveys of household consumption

SOCIÉTÉ SCIENTIFIQUE D'HYGIÈNE ALIMENTAIRE
SERVICE D'ENQUÊTES SCIENTIFIQUES SUR L'ALIMENTATION
 SUBVENTIONNÉ PAR L'ACTIVITÉ NATIONALE D'HYGIÈNE

Directeur: M^{me} L. RANDOIN
 18, Rue de l'Estrapade – PARIS - V^e
 (Téléphone : Odéon 48-43)

ENQUÊTE SUR L'ALIMENTATION FAMILIALE

N^o de l'Enquête : F. 92
 Lieu : VINCENNES (Seine)
 Date : Janvier 1945

<u>COMPOSITION DE LA FAMILLE -</u>	Age	Taille	Poids	Santé	Occupation
Père	70 ans	1 m, 66	53 kg	tendance diabète	sans profession
Mère	64 ans	1 m, 63	54 kg	assez bonne	ménagère
Fille	19 ans	1 m, 59	54 kg	bonne santé	étudiante.

<u>QUANTITES MOYENNES CONSOMMÉES PAR PERSONNE ET PAR JOUR</u>					
Viandes	en ^{kg} .	0,045	Farineux	en ^{kg} .	0,051
Oeufs	"	0,002	Pommes de terre	"	0,075
Fromages gras	"	0,006	Légumes secs	"	0,032
Beurre	"	0,007	Légumes frais	"	0,635
Graisses	"	0,001	Fruits frais	"	0,154
Pain	"	0,398	Sucre et confitures	"	0,018
Huile	"	0,001	Chocolat	"	0,001
			Condiments	"	0,010

Results of the consumption survey conducted with a household, January 1945. Archives Nationales 19770621/22

These household records offer two main benefits. First, the products consumed within the household are relatively well detailed (eggs, oil, butter, bread, etc.). Most of these products correspond to items included in the official SGF/INSEE CPI, which makes it possible to approximate the actual consumption of Parisians for a number of these item. The second advantage is that each record details the age of each household member. This allows us to know exactly their rationing category and, therefore, the exact amount of food obtained legally by the family. Indeed, we found data that allowed us to precisely determine the amount of food that the State rationing services distributed to families each month (See Online Appendix 5).

Consequently, it becomes possible to compute the proportion of the consumption supplied by the rationing system, since we know the monthly official ration depending on age, occupation and gender. It is thus feasible to determine not only the total amount of food obtained outside the official rationing circuits but also its breakdown by product, which leads to an almost direct estimate of the proportion of legal versus illegal retail supplies. It also allows us to retrospectively identify whether a particular product was subject to an active black market. For instance, bread, a key staple, was a product for which black market quantities were significantly small when compared to rationing supply. Conversely, products like meat were subject to a more active black market.

One limitation that could be attributed to this approach is that a family, on an individual level, might have saved up its official rations from the month prior to the survey and thus consumed both the distributions of the survey month as well as its reserves. In such cases, illegal consumption would be wrongly assumed when it was in fact the use of reserves from the previous month that allowed this unaccounted for consumption. However, this objection has limited impact. indeed, most food is perishable and cannot be stored long-term. This applies to bread, meat, butter, eggs, milk, etc.

But the argument does hold for easily stored products like oil or potatoes. For instance, potatoes were only distributed a few months a year and were considered the year's food reserve – a fact visible in the seasonal variations in potatoes prices. To mitigate this bias, we have chosen to proceed with an index that is not monthly but quarterly, which allows for a larger number of respondents and limits these statistical biases, while averaging seasonal patterns and price outliers. To account for the case of potatoes and oil, which are unevenly distributed throughout the year, we have opted to annualize the consumption and

distribution of these two commodities. While this prevents the study of seasonal variations in the official/illegal market ratio, it does help minimize the bias of family reserves.

If we can offer an estimate of the illegal/legal market ratio in Paris between 1945 and 1948, we need to use other sources to get an idea of this ratio during the years before the Liberation of France.

The SNS, following in the steps of the SGF, was the direct ancestor to INSEE. Between 1942 and 1944, this organization attempted to understand the mechanisms of the black market, its prices, and its significance. Its findings were compiled into a single publication titled *Enquêtes diverses sur les prix et les consommations* [Various Surveys on Prices and Consumption] (INSEE, 1947). This document provides valuable information to extend our price series: firstly, by offering data on consumption in 1944, then by detailing the consumption of meat more precisely than the Randoin surveys, and finally, by allowing us to approximate the prices of friendly transactions (grey market).

The consumption levels estimated for 1944 derive from three consumption surveys conducted from 24 January to 6 February 1944, from 22 May to 4 June 1944, and from 25 September 1944 to 8 October 1944 among the families of employees working within in the SNS's sixteen regional head offices, including Paris. Most of them were not particularly well-off economically, as most of them were auxiliary staff²², and thus fit into the general pattern of a CPI based upon a worker's household in Paris. The questionnaire focused on food consumption, and, to avoid potential insincere responses, asked about quantities rather than prices. It highlighted products quite similar to those in Lucie Randoin's surveys, allowing us to

²² Sauvy « Démographie et économie de la France en 1944 ». Archives nationales 20000115/18.

add three data points to our index, by establishing the actual consumption of Parisians in 1944. It also provides insights into consumption levels during the occupation: measured in calories intake, actual consumptions were quite similar to the immediate post-war period²³. This stability allows us to transpose the consumption levels of 1944 onto 1942 and 1943, as these years have relatively similar characteristics. Thus, we can determine the ratio of official rationing to illegal consumption with a high degree of certainty from 1944 to 1948 and with a high level of confidence from 1942 to 1944.

An interesting aspect of the SNS study is that it provides precise indications about the origins of the different sorts of meat consumed by Parisians. For instance, pork was heavily traded on the black market (86% was of illicit origin in 1944), while beef less so (45%). We hypothesize that the consumption structure of meat varied little throughout the entire period, thanks to technical and organic hurdles. Pork was indeed considered by observers as the quintessential black-market product because it is easier to preserve than beef. Applying this supply structure to the Randoïn surveys allows us to distribute the proportion of meat consumed illegally among pork, beef, veal, and mutton.

A last survey of interest to us occurred in January 1943, when the director of the SNS sent a circular to all his regional directors asking them to provide information about the prices and quantities on the sale of certain products. The aim was to determine, from the producer's point of view, the share she consumed, as well as the prices and shares sold 1), to acquaintances, 2) on the black market and 3) destined for the rationing services. Thanks to this survey, we have data providing estimates of these proportions for numerous products, which is a compilation of regional surveys covering the whole of France.

²³ For instance, Sauvy estimates the whole consumption in Paris at 2000 calories per capita in 1943, which is a bit less than the results found by Randoïn in Paris in 1945. AN 20000115/18.

This data has proven invaluable since the majority of prices we have found correspond to black retail transaction prices within Paris, while grey market transactions were more prevalent in rural areas, whether or not the buyer came from Paris. This survey thus allows us to compute grey to black market proportion and grey to black prices. Moreover, the statisticians analysing it at the time noted that “weighted average prices have some stability, even when weighting coefficients vary within certain limits” (INSEE, 1947: 11). Although the authors cautioned about the quality of their results, it is possible for us to approximate these proportions based on detailed results by product (figure 6).

Figure 6. An excerpt from the 1943 (published 1947) inquiry conducted among SNS’ employees

TABLEAU I. — Répartition de la production en 1942.
(Pourcentages de la production totale.)

DESTINATIONS DONNÉES À LA PRODUCTION.	BEURRE.		ŒUFS.		VIANDE DE PORC.		POULETS.		LAPINS.		POMMES DE TERRE.		LÉGUMES SECS (baricots).	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
Part du producteur.....	23	22	32	35	51	47	34	46	40	52	41	40	36	41
Part du ravitaillement général.....	46	48	26	28	16	17	9	8	8	8	37	38	33	28
Part des relations.....	14	13	18	18	15	16	26	19	20	19	12	11	11	13
Part du marché noir.....	17	17	24	19	18	20	31	27	32	21	10	11	20	18
ENSEMBLE.....	100	100	100	100	100	100	100	100	100	100	100	100	100	100

(a) Moyennes des pourcentages départementaux pondérées d'après les productions de 1939 (beurre, œufs, viande de porc), de 1937 (poulets et lapins) ou de 1941 (pommes de terre et légumes secs).
(b) Moyennes des pourcentages départementaux pondérées d'après le nombre des consommateurs au 1^{er} avril 1941.

Figure 1 : INSEE (1947 :14)

To approximate the grey to black market ratio, we compiled the proportions of each product for the years 1942, 1943, and 1944, this latter year offering a few additional products.

The overall results show that the quantities traded on the black markets were on average 1.21 times greater than those traded through friendly relationships.

Furthermore, an examination of the prices associated with these transactions reveals that black prices were on average twice as high as grey prices. Therefore, for the continuation of our study, we will rely on these data to estimate the grey-black market proportion within the illegal market and will use the level of black prices to estimate a level for grey prices, calculated as half the black prices. While these assumptions are obviously imprecise, they allow us to roughly approximate the share of the grey market, the exclusion of which would have biased the results of our study.

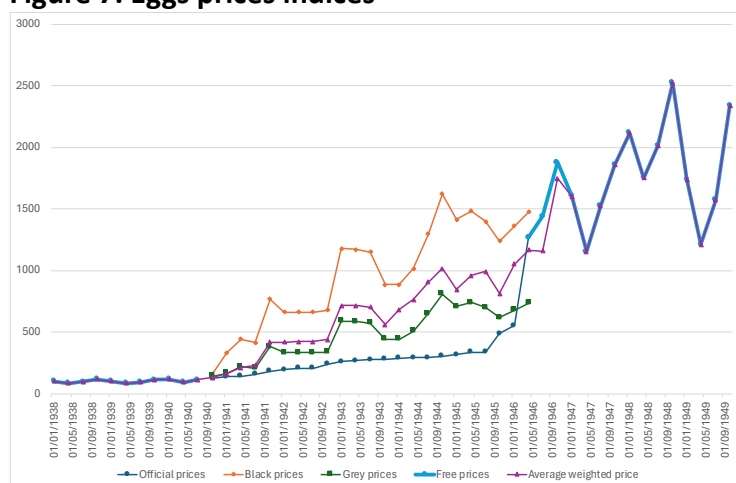
A new CPI: bridging the gap between available series and qualitative assessments

To better understand the process and its results, we begin by tracking only one product, eggs, and then move to the general results of our computation.

Eggs: an early example of shrinkflation

Eggs can serve as an excellent barometer for tracking price fluctuations during the period under review. Being relatively standardized (despite variations in size), easily concealed, but storable for a couple of weeks at most, they were significantly involved in grey and black markets transactions²⁴. Figures 7 and 8 showcase our findings based on the methodology detailed above.

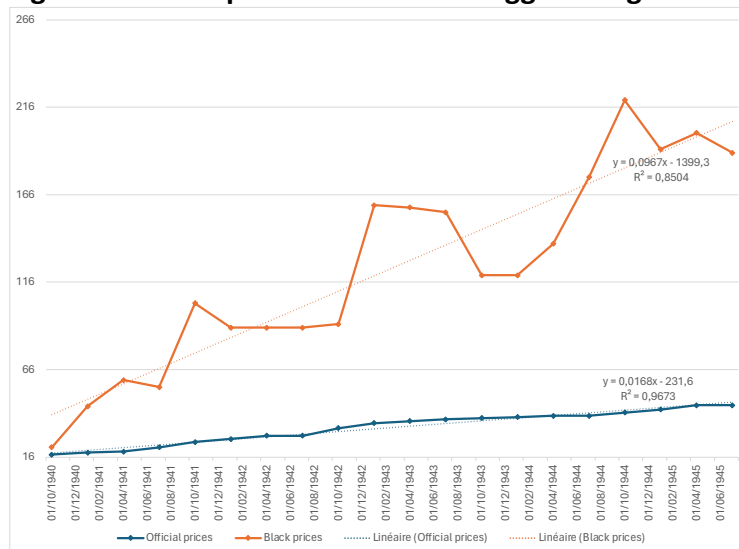
Figure 7. Eggs prices indices



Caption: Index base 100 free prices 1938. Authors' calculations. Miscellaneous sources (see text for references).

²⁴ Eggs are also one of the 5 items followed by Prof. Masato Shizume in his study of black prices in Japan during WW2 (Shizume, 2018).

Figure 8: official price for a dozen of eggs during the war, in current FF



Caption: Index base 100 free prices 1938. Authors’ calculations. Miscellaneous sources (see text for references).

First, the dark blue line tracks the state-controlled prices index based on SGF/INSEE data. This index exhibits a modest and almost monotonical trend of growth for most of the war period, at odds with the inflationary context (Figure 8). Indeed, from the last quarter of 1940 to the summer of 1945, i.e. during the war proper, the price dynamic was almost linear, contrary to a classical inflationary situation (the simple linear adjustment curve yields a r^2 of 0,976 between the last quarter of 1940 and the third quarter of 1945, as compared to 0,8504 for the black prices). The quarterly increase during this period is limited to 5,3%, or 25% per year on average from T4 to T4, while black prices increase at a quarterly rate of 16,4%, or 121% per year on average from T4 to T4. Moreover, black prices feature important seasonal variations (Figures 8 and 9), hinting at market-driven influences²⁵. This is why the sharp spike in official prices in 1946 (Figure 7) does not bear much economic significance: official fixed

²⁵ Though the evidence is limited given the short span of quarters, the third quarter in both official and black prices exhibit the lowest growth in prices between 1940 and 1945. But for official prices, the third quarter registers 76,6% of the average quarterly growth during the period, while only 63,3% for the black prices.

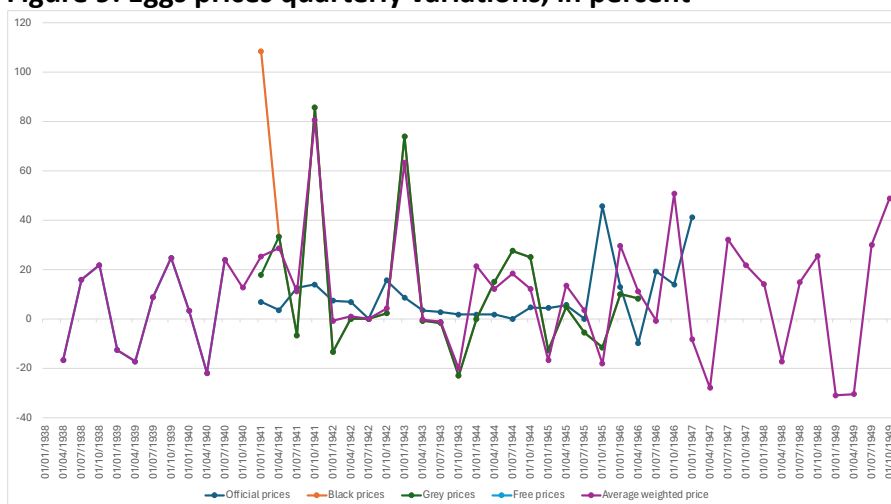
prices were only superseded, in the official price index, by free prices, close to black prices, as transactions on eggs shifted towards a freer and better provisioned market. The sharp increase in official prices thus reflects the vanishing of rationed supplies.

In orange (Figure 7 and 8), we feature the black prices index we have developed, which aligns closely with the model introduced previously. At the onset of shortages, namely when rationing was implemented, black market eggs prices began to stray rapidly from the official rates. Another hint at the shortage dynamic is that, over the period, the black price of one egg was more and more substituted to the price of a dozen, which had been the usual way to quote eggs: an early example of shrinkflation, motivated by acute shortages. This wedge widened as the shortage worsened, peaking during the crisis's height in mid-1944. From 1945 on, and especially in 1946, as conditions shifted towards relative abundance, the black-market pressure eased, leading to a fast reduction of the wedge from the 1944 peak until 1947, when free prices became dominant. Hence, the gap between black and official prices narrowed as the shortage ended and free prices were restored, but at a price level closer to that of black prices, confirming our model's predictions.

Lastly, in purple, we introduce our calculated series, which incorporates black, grey, free and official prices, weighted to their share in consumption, accordingly to our previously discussed methodology. This computed price series exhibit a more or less uniform rise over the period examined, unlike the official or black prices' trajectory, but with larger and larger swings (Figure 7). To investigate this last issue, we Figure the quarterly variations in percentage (Figure 9). The larger swings appear to just be an artefact: on the contrary, the variations in eggs prices reverse to the pre-war seasonal pattern, with moderately larger swings, but much

lower than in 1941-1944. As in Prof. Shizume’s study of Japan black markets, black prices seem to sway from seasonal patterns (Shizume, 2018).

Figure 9: Eggs prices quarterly variations, in percent



To conclude on this example, the move towards price liberalization in 1946/1947 based on our comprehensive index does not exhibit a brutal break, as with the official prices series, suggesting that our weighted average series mirror the eggs prices and eggs markets dynamics more accurately than the official price index²⁶.

Putting all our eggs in the same basket: aggregating prices

The egg prices example has shown that our methodology is sound and allows for a better understanding of prices evolutions and interactions between the different transaction domains (free, official, grey and black) between 1938 and 1949. More importantly as we will

²⁶ The fact that the new calculated price does not immediately align with the free price index is due to a transition period of several months during which the government continued to distribute eggs at lower prices than free market prices.

stress below, it allows us to integrate these different domains into one comprehensive index, leading to a more accurate perspective on French prices, inflation and purchasing power of money over the 1938-1949 period.

Table 2 exhibits our general results and the consistency of our methodology and model. As forecasted, black prices diverged quickly from official prices, which were based on previous free prices, as soon as these official prices were implemented, mostly in 1940. While the government tried to avoid or delay increases in official prices, despite growing shortages, black prices exhibited a much faster trend, as black markets accommodated incompressible needs unaccounted for by rationed deliveries. The maximum wedge between official and black prices was reached in 1943/1944, but it is interesting to see that while the wedge was widened until early 1944 by the growth in black prices, its reduction was mostly the result of an increase in official prices. Indeed, after mid-1944, as the German started to disappear and imports to increase, the supply shortages that had fueled black prices eased and the latter even diminished for a short period of time. This occurred precisely when the State, because supplies level were returning to adequate or near-adequate levels, started to free transactions on some staples, turning black prices into market prices or increasing official prices to actual market prices. The official price index was thus artificially pushed upwards, as it combined both the unaccounted inflation of the past (the unaccounted effects of black and grey prices) and the ongoing inflation trend. We could even say that when the official price index accelerated in early 1945, it did so at the very moment the pressure of black markets on prices was starting to ease (Figure 10). This discrepancy between data and official indices skewed both contemporary and historical perspectives on inflation, as the narrative on prices between 1938 and 1949 focused only on official statements and completely ignored the facts. Last, from 1947

on, the spread between prices tended to diminish as the law of one price expanded its influence, progressively unifying the myriads of markets into which the French economy had fragmented since 1940²⁷.

From the available evidence, it is thus clear that the actual level of food prices as tracked in the 29 items official CPI – food being the dominant category in the official CPI – in 1945 France was at least 80% above the official index, this discrepancy explaining most of the subsequent acceleration in the official CPI. Figure 10 exhibit a spectacular similarity between our hypotheses and what actually occurred, completely reversing the standard narrative of a post-1945 price acceleration. In fact, if we take into account the black and greys markets, the general trends of prices show a sustained acceleration between 1940 and 1944 and a more moderate increase after 1944. As such, our new price index shows no clear acceleration of prices at the time of the Liberation and only a modest one after the victory over Germany.

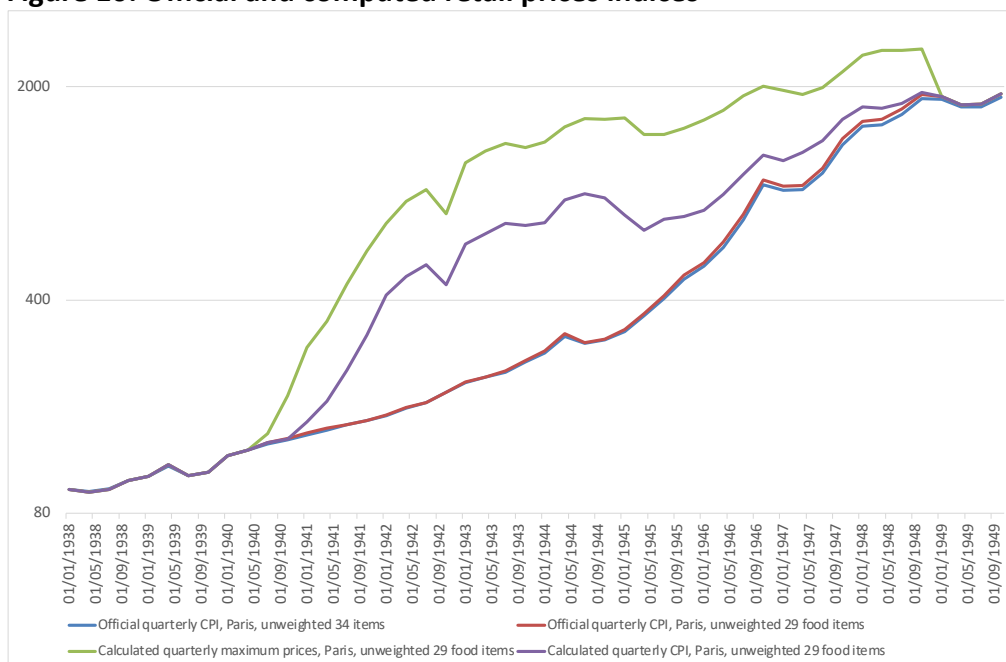
Table 2 – Comparison of official and maximum unweighted prices indices, 29 official items

	[1]	[2]	[3]	[4]	[5]
	Official prices	Maximum prices	Wedge between [1] and [2] in %	New CPI (food items)	Wedge between [1] and [4] in %
1938	100	97	0	97	0
1939	108	109	0	109	0
1940	129	148	12	132	0
1941	151	413	168	223	44
1942	175	811	344	466	156
1943	223	1234	432	671	189
1944	285	1485	407	833	184
1945	394	1457	270	732	86
1946	645	1780	145	977	34
1947	1007	2016	86	1315	21
1948	1633	2615	56	1773	6
1949	1817	1815	0	1815	0

Caption: until 1940, maximum prices and free prices are the same. From then on, black, prices become the maximum prices, and are progressively replaced by free prices again during the 1946-1949 period.

²⁷ Which does not amount to a full-fledged free-market restoration, as the French economy remained heavily regulated and state-controlled up to the 1980s. REFERENCE

Figure 10: Official and computed retail prices indices



A firsthand witness-validated result

One of the most striking features of our inquiry and of its results, are the rare but very convincing analyses by contemporary specialists, i.e. between 1947 and 1950, that corroborates our findings. These testimonies come into two forms: 1) general statements that explain why official indices are poorly constructed; 2) specific studies that reach – alas with statistical data we have not been able to recover – conclusions similar to ours.

Alfred Sauvy, who was at the time a statistician, an economist and the head of a statistical agency, figures prominently in both categories. For example, in 1952, he explained that, to study inflation between 1940 and 1949, “it would be necessary to start again the history of prices, taking into account clandestine quotations and their importance”, because

“the fact that the indices only took official prices into account led to numerous errors of interpretation, from which we are still suffering today” (Sauvy, 1952, 95).

Another very interesting testimony bridges the gap between the two categories, and documents how sensitive and politically charged were these questions. It comes from a letter exchange between André Piatier and Alfred Sauvy, in November 1978, in relation to Sauvy’s book publication, *La Vie économique des Français de 1939 à 1945* (Sauvy, 1978). Piatier (1914-1991) is a very important figure in the history of French statistics. A Resistant working at the heart of Vichy’s economic intelligence agency (*Section d’Études Économiques*), he was among the organizers of the merging of several public statistical bodies into the new INSEE in 1946, where he headed the conjuncture department before returning to the academic life, in 1947. In both positions, he had professional exchanges with Sauvy.

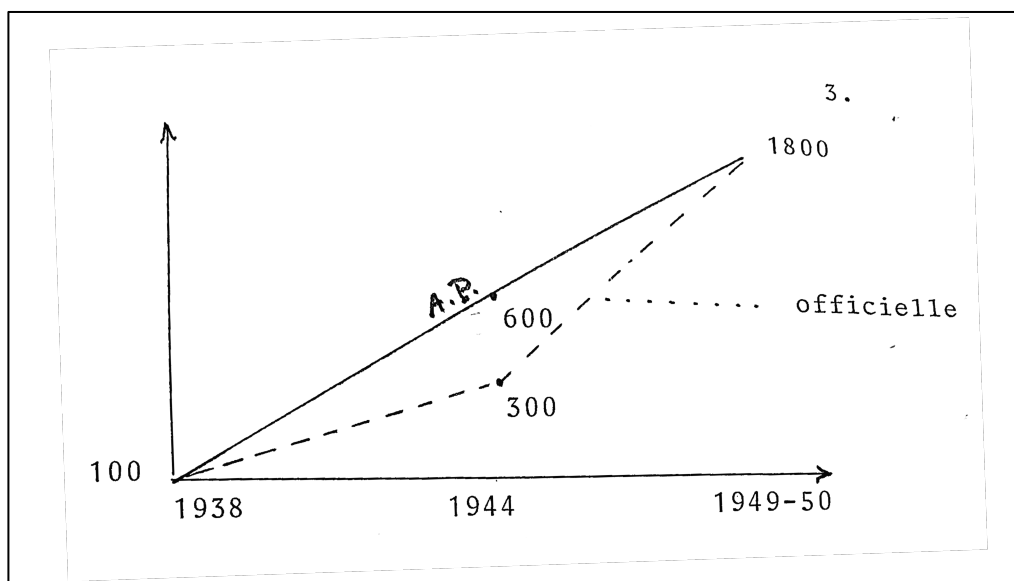
Exchanging ideas with Sauvy he issued a scathing opinion on the classic 1958 three-volumes publication about French life during the Occupation (Hoover Institute, 1957)²⁸, and the self-justification book from Yves Bouthillier (Bouthillier, 1950), writing to Sauvy (20 years later):

“Too many personal accounts – and the book by Y. Bouthillier's book is no exception to this rule – aim to show that the country's financial management was a success, since the value of the currency was safeguarded. Such a position is inaccurate [...] a calculation I attempted with a working group at the Ecole Pratique des Hautes Études showed that, taking into account the real food basket of the housewife in 1944, prices had increased sixfold, not threefold²⁹”.

²⁸ This publication opened up a space of self-justification for eminent Vichy politicians or their descendants, such as Yves Bouthillier and Josée Laval, wife of René de Chambrun and only daughter of Pierre Laval, who devoted a great deal of time and energy, financed by her equally considerable fortune, to trying to rehabilitate Vichy and her father – and perhaps her own behavior during the war.

²⁹ Correspondence from A. Piatier to A. Sauvy, Nov. 8, 1978, Archives Nationales, *op. cit.*

Fig. 11 – André Piatier’s sketch of the price movement between 1938 and 1949



Caption: Correspondence from André Piatier to Alfred Sauvy, November 8, 1978. The dotted line (“officelle”) represents the official price index. The solid line (A.P.) represents Piatier's interpretation of the price dynamics at that time. The figures correspond the price index rounded values. Source: Archives nationales 20000115/18.

To make his point clearer, Piatier illustrated his letter with a sketch of how a comprehensive (A.P.) price index would compare to the official one (Fig. 11). Thus, several specialists did propose some tentative values of what would have been an accurate CPI or food prices index for the period 1938-1949. We have gathered all the series we found in Table 3, except the detailed ones from Malignac (see below).

Table 3 – Various CPI index from diverse authors, end of year figure, base 100 1938

	[1]	[2]	[3]	[4]	[5]
	Sauvy 1978 consumer prices, including black prices	Malignac 1951 Food items, including vegetables and black prices	Rivet and alii Prod. Price index	Du Gast and Richaix Price index	Piatier 1978 CPI sketch
1938	100	100	100	100	100
1939	109				
1940	149				

1941	198				
1942	261				
1943	357			668	600
1944	495				
1945		854	700		
1946		1300			
1947					
1948					
1949	1650				1800

Caption: all figures relate to the last three months of the year. Precise months are included in the statistical material.

The general assessment from Piatier and Sauvy's figures are corroborated in the more precise work of Malignac and Sauvy. Georges Malignac, a statistician and demographer at INED (Institut national d'études démographiques) worked closely with Alfred Sauvy, who directed INED from its inception, in 1943, to 1962. In 1951, Malignac published a study in the *Journal de la Société Statistique de Paris (JSSP)* aiming at describing the average Parisian industrial worker's wage in purchasing power terms. He thus explained his methodology:

"Between 1944 and 1948, the only official indices were the retail price indices published by INSEE. However, due to the existence of a "black market" alongside the regulated market, these indices were not representative of variations in real food prices. The problem of measuring the cost of living in the case of official rationing was the subject of judicious remarks by M. Sauvy³⁰. We won't go into it again here, but will simply indicate how we have calculated an index that more closely reflects reality than that of the 34 items. With the help of surveys and evaluations carried out at the time by the *Institut National d'Hygiène, the Société Scientifique d'Hygiène alimentaire*, the INSES, the *Direction du Contrôle Économique* and the *Services du Ravitaillement*, we were able to determine the quantities actually consumed and the average prices on

³⁰ This publication from 1948 was later developed in (Sauvy, 1952).

the underground market. Taxed prices and ration rates then enabled us to calculate real prices for 29 food items, and a price index for vegetables.” (Malignac 1951, 128)

Malignac’s index is based in 1938 (Fig. 2) but he used a linear interpolation between 1938 and April 1945, and then interpolated a value for April 1944 based on the successive values he computed for April 1945, 1946 and 1947. Also, we decided to discard this 1944 interpolated value and start his series with his first robust April 1945 estimation (see Figure 12). But one must remember that Malignac nonetheless includes vegetables into this index, which as stated above were never rationed and could be partially substituted to the missing staples, but also housing, garments, heating and miscellaneous expenses³¹. Food still represents 60% of the weights in his index.

Fig. 12 – Malignac’s index of the “cost of living in Paris”

Avril 1944.	450
Avril 1945.	590
Octobre 1945	650
Avril 1946.	700
Octobre 1946	950
Avril 1947.	960
Octobre 1947	1.250
Avril 1948.	1.360
Octobre 1948	1.530
Avril 1949.	1.600
Octobre 1949	1.650
-Avril 1950.	1.770
Octobre 1950	1.900

Source: (Malignac 1951, 129)

³¹ Though he did not precise what was were these “*dépenses diverses*”, it may have included tobacco, alcohol and hygiene expenses.

Luckily, to allow for a stricter comparison between the official 29 items index, our own calculated 29 items index and Malignac's index, we can build on another, shorter, unpublished series from Malignac, on the 29 items (Table 4). The complete data and quarterly CPI are included in the Online Excel Appendix (see also Table 5).

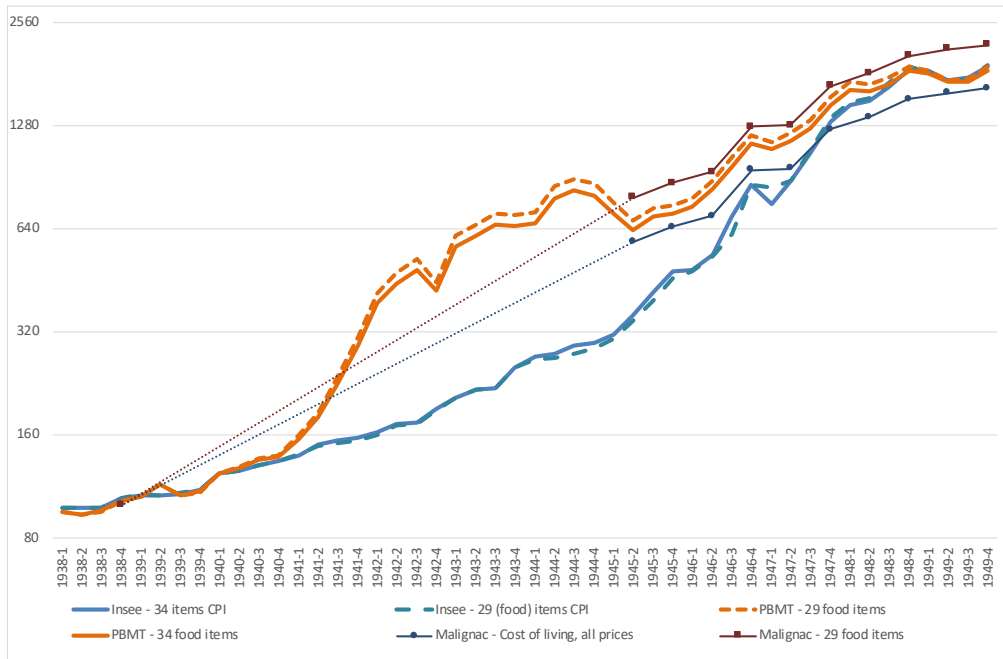
Table 4 – Malignac 1944-45 indices and ratios to other indices

	[1]	[2]	[3]	[4]	[5]	[6]
	Malignac 29 articles	Malignac index	[1] / [2] %	INSEE 29 items	PBMT index	[1] / [5] %
Avr. 45	797	590	135	362	679	117
Oct. 45	854	650	131	482	751	114
Avr. 46	929	700	133	619	887	105
Oct. 46	1300	950	137	992	1198	109
<i>Average</i>			134			

Sources : Archives nationales 20000115/14

The very stable relationship between the two Malignac's index allows us to tentatively use his longer [2] index to compute a 1944-1949 29 items price index (Figure 13, using the 134% relationship to extend Malignac's 29 articles series). We can see that our index is somehow in-between both Malignac's indices, and that it clearly not overstates the actual average level of his 29 items index, to which it progressively catches up. This catching up process most likely hints at the reverse substitution process between vegetables and other staples on the one hand and rationed items on the other hand, that occurred after 1946 (Sauvy, 1948, 43), which we did not capture, as well as the favourable impact on the cost of living of housing rents and energy prices controls after the war.

Figure 13 – Comparison between official, Malignac and PBMT’s indices



Conclusions and final remarks

As we have shown, statisticians at the SGF, SNS, INED and INSEE, were well aware that the official price index provided only a skewed perspective on reality. But then, why did the SGF/INSEE not conduct a study similar to ours at the time?

Raymond Rivet (1906-1958) (Hénon, 1956, 3) (Dumas, 1958, 245) was one of the most prominent statisticians from SGF and then INSEE during our period, “a pure statistician and only a statistician” to quote the words of presentation when he was elected at the head of the *Société statistique de Paris* in 1956. He explained that black prices were not included in the calculation of the indices primarily “to avoid any accusation of arbitrariness. The clandestine market has such diverse aspects that its observation can only be largely subjective” and “to avoid any accusation of arbitrariness, only controlled or free prices, that is, openly observed prices, were taken into account” (Rivet, 1947, 870).

However, methodological difficulties are not the only reasons for not looking beyond official prices. Taking black prices into account and publishing an index reflecting the higher transaction prices was politically sensitive, especially for the Vichy regime. Propaganda against the black market was intense, and governments invested a significant part of their political capital in combating this phenomenon, whether through appeals to patriotic sentiments or repressive tools, such as the establishment of the *Contrôle Economique* (Grenard, 2008) (Mouré, 2023). A price index including black prices would have illustrated the impotence of authorities to rule out black markets but may also have vindicated the legitimacy of these markets as a key source of supplies to a deprived population. Encompassed within a published index, black market purchases would have appeared a widespread and normal practice...

The extractive relations imposed by Germany on France (Occhino et al., 2008) made the normalization of black prices even more difficult. The Nazis had an interest in keeping French prices relatively low, enabling them to use the heavy occupation indemnities to buy goods in France more effectively³², including on the black market (Sanders, 2008). They demanded a strict fight against black market, repeatedly threatening to take charge of its repression themselves. The Vichy government had to show good faith in its efforts to combat trafficking.

From this perspective, the publication of a black prices index, and worse, the inclusion of such prices in calculating the levels at which transactions (both legal and illegal) occurred, was a political impossibility. René Carmille, director of the SGF at the time (and direct boss to Rivet), built on this issue to give an almost final reason for not publishing a comprehensive price index. In a letter to his minister, he highlighted the risks of creating such an index:

“A much more serious issue is the establishment and communication to the German authorities of price or cost of living indices, whose variations (as specified in the Reich Statistical Office report) could affect the monetary parity of European countries. Such indices could be used, particularly, to alter the exchange rate of the mark expressed in francs.”³³

The Germans had indeed established an extremely advantageous mark to franc exchange rate, allowing them to purchase cheaply in France (Blanc, 2008) and could use any evidence of inflation as an argument for either increasing the occupation costs or the mark to franc exchange rate, making the publication of such an index by the SGF politically impossible.

³² The organization of the public control on wholesale products and prices started with the Vichy act of August 18th 1940, about at the time when a growing number of retail prices became fixed by the state.

³³ René Carmille, note to the Secretary of State for the Economy and Finance: “Communication of statistical information to the Occupation Authorities”, December 1, 1942. AEF B-72265.

Consequently, only the official price index was computed and made available. A major statistician at the time, Sauvy noted later that to study the 1940-1949 period, “one would need to revisit the history of prices, taking into account clandestine quotations and their significance”. However, “the fact that the indices only considered official prices has resulted in numerous interpretive errors that we still suffer from today” (Sauvy, 1952, 95).

The publication by INSEE of official price indices instead of clandestine ones has therefore led to interpretive errors. As Rivet explained, “This rule (of publishing only official indices), often misunderstood, has obviously, up to the most recent period, profoundly changed the meaning of the index; at various times, the increase in the index mainly reflected the transition of a commodity from the controlled sector to the free sector” (Rivet, 1949, 419). Thus, Rivet confirmed that it would be erroneous to think that the 1946 jump in prices reflected a fundamental trend: it was a statistical illusion caused by the freeing of numerous prices.

This is why the interpretation of prices during this period has raised such challenges for historians and economists until today. Indeed, while most agree that statistics, particularly price statistics, must be used with great caution and do not accurately reflect actual price trends, the absence of data providing an estimate of the black market’s significance for various products forces contemporary historians to continue using the official price index.

For example, we can observe, albeit non-exhaustively, that (Andrieu, 1984, 381), (Chélini, 1998), (Quennouëlle-Corre, 2000, 83), (Monnet, 2018, 166), (Margairaz, 1991, 266), and (Baubeau & Le Bris, 2017, 172) all relied on the official price index in their works. For example, Baubeau and Le Bris dated the reduction of the ratio of French public debt to GDP mainly in the post-war years, relying on the official prices index acceleration, while our new index indicates clearly that this reduction started well within the war.

The new index we propose in this article fills this gap and provides a more accurate representation of French inflation between 1938 and 1949 by encompassing all prices categories. To build this new index, we first demonstrated that the significance of prices movements between 1938 and 1949 allows for a relative disregard of the weighting of each product within the global index. When compared, the unweighted official prices and the weighted official prices series appear to be very similar. This similarity itself results from the high inflation context of the period, which led to a general trend of prices increases, and which is the locus of our study.

This characteristic enabled us to choose, among several, one strategy for offering a new estimate of price variations during the period. But collecting black and “friendly” prices in Paris was not sufficient to compute a new index. We had to estimate the proportion of products traded respectively on the official and on the illegal markets. This only allowed for a closer approximation of a price index reflecting the purchasing power of the French franc. The resulting indices proved to be very much in agreement with both anecdotal evidence and what contemporary statisticians had stated on a more qualitative basis.

We hope this index, besides changing the history of prices during the Second World War and its aftermath, will also lead to new results and that this simple methodology can be enriched or duplicated in other settings.

But already our findings led to some interesting insights. The conventional narrative about price movements during this era suggested that the Vichy regime managed to curb price hikes through stringent controls on pricing and market policies. The Liberation of France supposedly led to a gradual relaxation of these measures, paving the way for an inflation surge. This story is mostly based on the official price index published by INSEE (Figure 1). Our new

index challenges and even partly reverses this narrative, that has been heavily exploited to defend the Vichy regime's economic record (Bouthillier, 1950). We show that there is no clear surge prices series in 1945. Instead, the rise in prices appears to have been quite steady between 1938 and 1949. The idea that strong autocratic regimes are better at equipped to curb inflation than democratic countries is thus negated, a lesson that may yet be relevant in regard to Putin's Russia.

The implications are also significant when trying to explain the prices dynamics, especially regarding the impact of monetary and wage policies after the war.

Firstly, updating the underestimation of prices under the Vichy regime challenges the supposed effectiveness of the “circuit policy”. This policy, which aimed at reducing the “inflationary gap” between the money issued and the goods available to purchasers does not appear to have made much of much of an impact on price dynamics, contrary to many narratives, especially the self-serving one proposed by Yves Bouthillier, the Vichy Minister of Finance. What was effective, as evidenced in the UK or in the USA at the same time, was rationing, with these three huge differences that France was extensively looted, that it was cut from foreign staples and that domestic production was decreasing, not increasing.

Secondly, we find no evidence to suggest that post-war inflation was significantly driven by wage increases. The 1946 Palais Royal conference, which led to substantial wage revaluations, do not seem to have had a major impact on price trends. Though more precise analyses are wanting, any correlation between the official price index and the wages increases of 1945-1946 would be spurious.

Our new series of prices has thus numerous implications for the macroeconomic history of France during this period, from the public debt level to the standard of living, from

public finance to demographic issues and monetary policies and controversies. We also hope that these promising results will prompt new research both in France and elsewhere to challenge low-quality indices and explore wholesale and retail markets with a fresh eye.

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Appendices

Appendix 1 – A brief history of French price indices

A detailed history of the prices indices is available both from the public statistical offices reports, at the time they computed them, and from ex-post academic analyses. To make a long story short, French public offices published two main series of monthly indices: a wholesale prices index, starting 1911, and a consumer price index, starting 1913. As a bridge between these publications came the retrospective studies issued by the same statistical offices, in the form of yearbooks and specialized volumes. To this body of evidence, historians have added archival sources, enriching our understanding of the technical difficulties and political stakes associated with the building and the maintaining of sound prices indices (see detailed bibliographical information in the reference section).

Two main indices

The wholesale prices index started with only 45 items and was unweighted, which led to its replacement in 1926 by a weighted 126 items index, both weights and items being based in 1913. It was modified again in 1941 (the studies leading to this change predating the war) to include 135 items and new weights, with 1938 as a base year. This index lasted until 1950 when it was replaced by a 319 items index (base 1949) which also aimed at following the relative purchasing power of the main production and distribution sectors.

The consumer price index started in 1913 on a very narrow base: it comprised only 13 articles, was unweighted and was supposed to track the cost of living of a worker's household living in Paris. These severe limitations led to a new 34 weighted items index in 1931, based upon a worker's household of four persons budget (a male, a female and two children) in Paris. This monthly index was chained to the previous one with a 1914 base year, but to better track consumption patterns, was reweighted in 1939 with a base year in 1938, thus allowing for a direct comparison between the wholesale and the consumer price indices. Still calculated for a Parisian household, it was nevertheless completed by a quarterly index from 1938 on, tracking the same items in all metropolitan French towns over 10 000 inhabitants. As the wholesale index, it was replaced in 1950 (base year 1949) by a weighted 213 items index, based upon four persons households in Paris, but also tracked in all larger 17 French metropolitan towns. Nevertheless, as stated above, this latter index, though designed with the best practices in mind, was soon biased by government interventions, aimed at the goods prices and at the definition of the index itself (Touchelay, 2015).

The limitations of the indices during black markets

These monthly CPI indices form our "official" baseline and are still the ones effectively used by scholars to follow prices during this period, despite the fact that they do not take into account illegal or unofficial prices. It must also be remembered that, because many items ceased to be available during and after the war or were replaced by substitutes or lower quality goods, the official index is not exactly what it seems to be. Past 1940, "soap" contained less and less fatty acids, until 1945, but still it remained as "soap" in the official index, though the

quality decrease was somehow (but how?) taken into account in the calculations. Similarly, due to the rapid shifts in consumption patterns because of shortages and rationing, the weights based upon a stable basket of goods used in the index ceased to be relevant. Last, some products became absolutely fictitious, substitutes accounting for an ever-increasing proportion of the genuine product, up to the 1943-1945 period, during which any trace of cocoa or coffee beans had been effectively removed from “chocolate” and “coffee”. As indicated in the Bulletin Général de Statistiques:

“As far as possible, every effort was made to ensure that items were comparable, and where this was clearly impossible on several occasions, prices were increased to take account of the drop in quality (milk, coffee, soap, lighting gas, etc.). Such adjustments could not be made for bread, pasta and cheese, for lack of sufficiently precise documentation. As and when products reappeared in their original form, the real grades were substituted for the fictitious transitory grades (coffee, soap).

However, it should be emphasized that the composition of the “shopping basket” established in 1930 by the Central Commission for Cost-of-Living Studies has been respected, and the weighting has remained constant since that date. We have also used only official prices, except for the adjustments provided for in the previous paragraph.³⁴”

This is at least one reason why, when Jean-Claude Toutain (Toutain, 1997) computed his French retrospective GNP series, he discontinued its collection for both volumes and prices during the 1938-1948 period. This means that, to date, there is no academic-proof series of prices, whether linked to the national accounts or to households’ consumption budgets. This is the gap we want to bridge.

Thus, over this short time span of 10 years, three different index formulas were used: until 1939, from 1938 to 1950, from 1949. But the prices observed were not the only issue: the weights associated to each item lost almost all meaning from 1940 to 1948, when people and firms had to restrict their consumption or look for substitutes in face of general and evolving shortages. But it would be a mistake not to acknowledge that the statisticians at the time were not acutely aware of the problems pertaining to the computation and use of these indices. One can quote from INSEE’s retrospective statistical publication devoted to the 1938-1948 period (INSEE, 1950):

Price indices are among the most difficult to interpret. Indeed:

The existence of clandestine transactions distorts the calculations, which are based solely on regulated or free prices³⁵. However, these transactions take place at multiple prices, sometimes much higher than legal prices, and their relative importance is generally unknown.

³⁴ INSEE, Bulletin Général de Statistiques, 1946, n° 2

³⁵ One of the problems occurring when studying prices during this period are the frequent changes in the meaning of the terms used, according to the writer or the period. Here, in 1950, the author (André L.A. Vincent) means that indices are based on publicly quoted prices, whether “regulated” (*taxés*) or “free” (*libre*), as opposed to grey or black market prices (unregulated by definition). But during the Occupation, “free prices” could be a shorthand for grey, black and family prices...

The increasing dispersion of observed prices (regulated or unregulated) means that synthetic indices lose their usual significance. The latter is even more affected by changes in the structure of transactions, changes which complicate the problem of weighting the indices involved (for wholesale prices, two weightings have been adopted, that of 1938 and that of 1941).

The difficulty of effectively regulating the prices of manufactured products (due to their great diversity, quality issues, etc.) further reduces the significance of indices, which do not include such products. In fact, the de facto freedom generally allowed to manufactured products has enabled their prices to rise much faster than those of effectively regulated products (raw materials, semi-finished products, foodstuffs and many services).

Lastly, qualities have often declined without it being possible, in most cases, to take this into account³⁶.

³⁶ André Vincent, INSEE, 1950, p. 58.

Appendix 2 – alternative ways to estimating price dynamics

In this annex, we present two ways to have a better understanding of price dynamics in 1938-1948. These ways were not developed in this article but are, more or less possible options. The first is the assessment of the underestimation of official prices (1), the second is a way to deal with the weight issue between official and illegal markets (2).

Estimating the underestimation

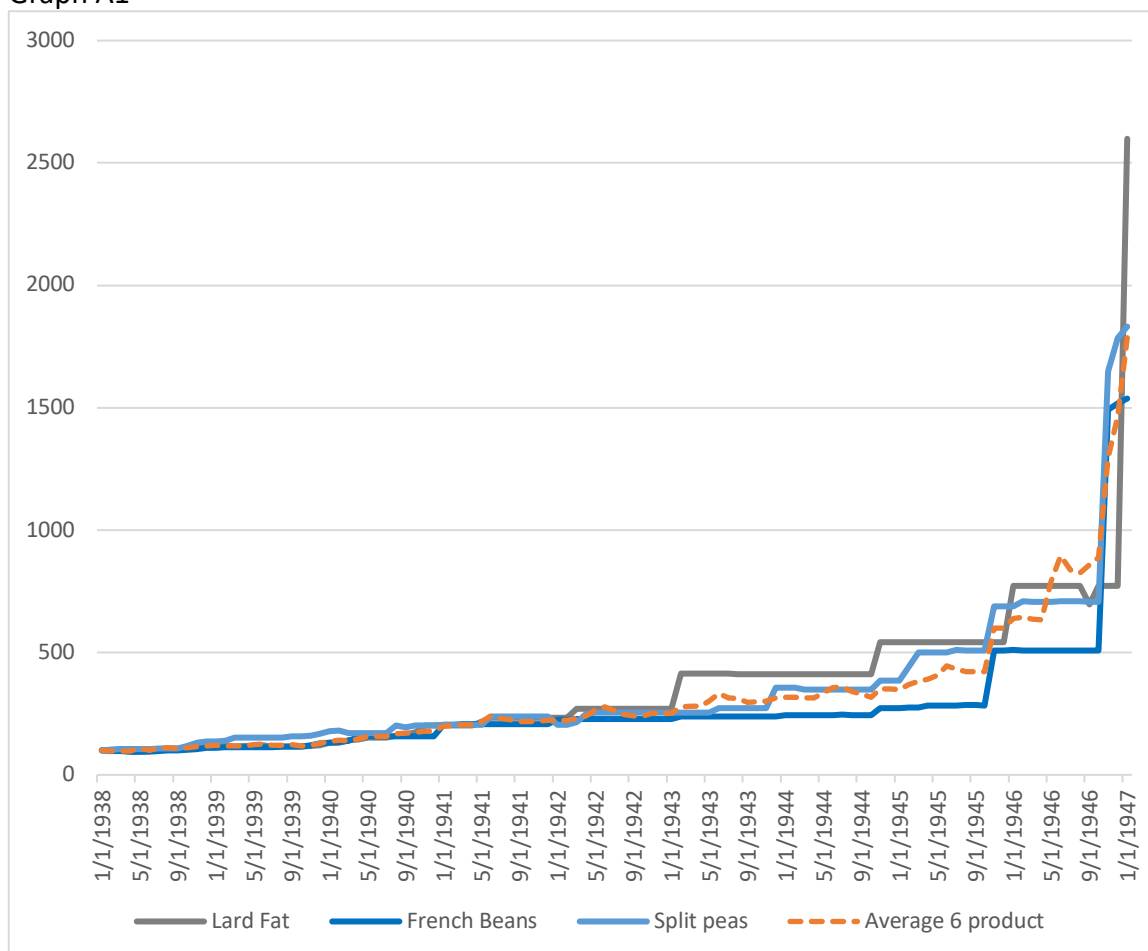
Using the series of the 49 average official prices in Paris, we compute the hike in prices following the transition from rationed to free or “tolerated” prices. These transitions occurred at different times between 1946 and 1949. For some items we do not have the information because these products were freed later. It is the case for bread, wheat flour, milk, butter, cheese, rice, sugar, coffee, chicory, tea, noodles, dates, beer, cider, methylated spirit, lamp petroleum, and coke. The idea here is just to average the different computed hikes, reduced to a month-long period in order to make them comparable, in order to approximate the difference between official unfree and free prices. Examples of those calculations are presented in Graph A1 and Table A1.

Graph A1 represents the official price of lard fat, french beans and split peas. It is very indicative of the behavior of the majority of official prices we have observed. With the price being controlled, the government does not allow it to change for long periods until an official—and sometimes quite sharp—increase occurs. Then, during a new period the official prices are denied from any increase. Thus, the price of lard fat remained fixed by the government at 35 francs from March 1942 to February 1943, when it was set at 53.50 francs. It then experienced almost no variation until October 1944. This results in a stair-step shaped curve, that is common to most of the official prices we have studied.

How should we interpret the sudden price surge that appears to occur in November-December 1946? Indeed, we observe that the prices of French beans, split peas, and lard fat experience a sharp increase. For instance, the price of lard fat jumps from 100 francs per kilo in December 1946 to 336 francs per kilo in January 1947, marking a 236% increase. The economic conditions, supply, and demand remain unchanged during this short period. This surge is evidently the result of the liberalization of lard fat prices, allowing merchants to set their own prices freely. Consequently, prices once again reflect strong demand and limited supply. The risk here is to misinterpret this sudden price increase as a result of changing economic conditions, in other words, as a natural inflationary phenomenon.

Economists and historians recognize the artificial nature of a staircase shaped price curve. However, aggregating prices to form an index (for example, the INSEE’s 34-item index) dilutes each increase and creates a curve that appears much less artificial. Indeed, each price increase, whether due to government revaluation or market liberalization, does not occur simultaneously for every product. This leads to a smoothing effect on the curve, giving the false impression of a natural progression. This point can be demonstrated using just six products shown in Table A1. The average of these products is represented by the orange dotted line in Graph A1. Some products, like potatoes, were liberalized as early as August, creating the impression that the inflationary movement occurred throughout 1946. In summary, the aggregation of the six products smooths the “6-product index” and obscures the fact that each product’s price curve individually resembles a staircase.

Graph A1



Those increases, when a price is liberated, can give us clues on the undervaluation of official prices. Indeed, we can easily compare the official price the month before the liberalization to the free price. A computation of these hikes shows us a clear undervaluation of official prices, compared to the free prices. Table A1 presents examples of such hikes.

Table A1 – Price determinants for seven household products

	Eggs	Potatoes	French beans	Split peas	Lentils	Lard Fat	Total in 1946
Quantity	douzaine	kg	kg	kg	kg	kg	
Price control start date	08/07/1940	06/07/1940	31/07/1940	19/01/1941	19/01/1941	06/08/1940	
Price control end date	01/04/1946	01/08/1946	01/11/1946	01/11/1946	01/11/1946	31/12/1946	
Price at control end date	67,55	11,21	32	32,5	40,7	100	
Price freedom start date	01/05/1946	01/09/1946	01/12/1946	01/12/1946	01/12/1946	01/01/1947	
Price at freedom start date	166	13,13	95	50	95	336	
Variation in %	146	17	197	54	133	236	131

Caption: The “Price freedom start date” indicates the first data point for which we have a price. It thus may be later than the “Price control end date”, hence the need to compute a monthly variation. The average variation for these six products is 131 %.

The “weight a moment” strategy

The above proposal would only allow for a crude estimation of a general CPI based solely on official prices and computed along a progressive increase (decrease) of the weight of black prices on the general index, assuming the former to always be about 50% dearer than

official prices. In reality, the impact of black prices on the general price level would depend heavily upon the proportion of products exchanged on official and unofficial markets and on the wedge between white, gray and black prices. But black markets being black we have almost no indication regarding their actual weight.

One proxy we can think of is the caloric intake derived from the official daily ration. Considering that the French people managed to make for the missing calories to reach their baseline metabolic requirements (Table 3), it is then possible to proxy an unofficial to official purchases quantity ratio, with three major caveats: 1) all foods are not equally caloric; 2) it concerns only food and not the other consumptions items; 3) fruit and vegetables are not part of the official index, even though their price in Paris was tracked. Nevertheless, the INSEE retail price index being mostly composed of food items, the second caveat is not very important (Graphs 1 and 2).

Despite these caveats, Table A2 provides valuable insights into the calories officially supplied by the provisioning services to the French population (specifically in Paris). It is striking to observe that the number of calories is consistently well below the essential requirements. This indicates that throughout the war and the early post-war period, the French were compelled to find alternative, often illegal, sources of consumption to avoid famine. Table A2 shows that the period when the official calorie supply was most limited was in 1944, which is logical given the resurgence of armed conflict on French soil. During the first two semesters of 1944, the calories provided by the State barely reached 38% of the caloric needs of an adult male, indicating that reliance on illegal markets likely became even more crucial for survival.

However, it should be noted that tracking the reliance on alternative sources to rationing becomes more challenging from 1946 onwards, as this year marked the beginning of significant liberalizations. As products were freed, purchases were unrestricted and thus not included in the calories provided by the government. This is also why the calories supplied by the provisioning services represent an increasingly smaller proportion of essential needs from 1946 onwards. Unlike in 1944, this does not reflect a worsening situation but rather the liberalization of the sale of numerous products.

Table A2. Official daily ration delivered to adults in Paris

	Calories officially delivered	Calories available in % of metabolic baseline (2,400 Kcal)
01/01/1941	1284	54%
01/04/1941	1284	54%
01/07/1941	1284	54%
01/10/1941	1284	54%
01/01/1942	1181	49%
01/04/1942	1181	49%
01/07/1942	1167	49%
01/10/1942	1215	51%
01/01/1943	1140	47%
01/04/1943	1134	47%
01/07/1943	1119	47%

01/10/1943	1105	46%
01/01/1944	894	37%
01/04/1944	917	38%
01/07/1944	994	41%
01/10/1944	1315	55%
01/01/1945	1487	62%
01/04/1945	1303	54%
01/07/1945	1280	53%
01/10/1945	1275	53%
01/01/1946	1300	54%
01/04/1946	1309	55%
01/07/1946	1170	49%
01/10/1946	1200	50%
01/01/1947	1259	52%
01/04/1947	1098	46%
01/07/1947	918	38%
01/10/1947	768	32%

Caption. Source : Études et Conjoncture (1ère année, n°5-6, 194) La consommation alimentaire de la France en 1945-46. Comparaison avec l'avant-guerre et prévisions pour 1946-47 and Archives Nationales, 1977621-7.

Nevertheless, the caloric strategy presents numerous limits, most notably the very differentiated impact of food shortages according to social and familial position in Paris. The social impact is straightforward: more affluent people could access gray or black markets more easily, thanks to their lower budget constraint. The familial position is more complex, depending on occupation (whether the firm or administration was large enough to fund or facilitate a food cooperative), age of children (teenager were particularly ill-served in terms of official daily rations, while pregnant women and young infants were more favorized) and links to rural life. In such a chaotic context, even the access to a bike and a measure of youthful energy could make the difference between hunger and reasonable supplies (Mouré, 2023).

Appendix 3 – Locally homogeneous black prices

The creation of a black price index faces an initial challenge: is it possible to create a relevant black price index when these prices are characterized not only by significant volatility but also by extreme variation for the same product?

An observer visiting France and randomly noting black prices for the same product would notice significant price divergences. Michel David (1945) provides an example of these differences, which characterized the entire period. In December 1942, while the official price of a kilo of butter was 66 francs, black prices varied greatly across different regions of France: in Angers, butter could be found for 100 francs, in Toulouse for 150-200 francs, and in Marseille for 500 francs! These differences can be explained primarily by supply capabilities. The region around Angers produces butter, while the hinterland of Marseille is agriculturally poor, making supply difficult. According to our data, black prices were higher there throughout the war than in Paris, for example. This difficulty is well highlighted by INSEE (1958, p. 115), which notes: “By their very nature, prices on clandestine markets are difficult to observe. At any given time, for a given article, there were not one, but multiple black market prices varying by location and the people involved.”

These price differences also reflect a market structure particular to the black market. It is difficult to speak of a single black market; rather, there are a series of small-scale black markets. This dispersion of the illegal market into multiple channels and transactions makes the existence of multiple prices quite logical. As Grenard (2004, p. 352) notes: “Clandestine markets are most often monopolistic or oligopolistic [...] These monopoly effects are very favorable to the seller.” Unlike in a competitive market situation, the seller appears to be the price maker here. Given the scarcity, individual demand is highly inelastic to prices, allowing the seller to freely choose their price. Since all black market sellers set their prices independently and without coordination, there is no reason for their prices to be similar. If black market prices are entirely divergent, creating a price index would make little sense.

In this appendix, we temper the view of completely isolated markets to show that there are price feedback mechanisms preventing sellers from raising their prices with impunity. In our opinion, the differences between black market prices can be largely explained by three factors: the volume of the transaction, the relationship between seller and buyer, and the geographical location of the sale.

The volume of transaction factor seems quite logical. Wholesale and retail purchases cannot be made at the same prices without causing the retailer to go out of business. This logic is particularly relevant in the case of the black market because the more the initial stock of products is retailed, the greater the number of intermediaries involved, and the higher the sum of their commissions. Price differences due to the geographical locations of transactions reflect the varying degrees of difficulty in obtaining supplies in a given region. Lastly, the friendly proximity between the buyer and the seller plays an important role, with the seller applying a higher or lower commission depending on their relationship with the buyer. Schematically, a transaction with a perfect stranger occurs at the maximum price, while a close friend or family member receives preferential rates.

Our argument here is that it is possible to obtain consistent black prices, provided that we collect transaction prices occurring under the same conditions of volume, location, and relationship between buyer and seller. Indeed, various contemporaries note that black prices form a relatively coherent set with similar prices in the same area, making it possible to establish an index tracking price trends over the period.

Thus, INSEE does not hesitate to present a list of certain black prices in Paris. The relevance of such a list is only possible if the black prices of these products in Paris are not completely divergent (figure AXXXX). It is noted that “some markets have shown a relative consistency. For example, concerning rationed food products in Paris, the following ratios between black market prices and official prices were observed” (INSEE 1958, p. 115).

Figure A1: Black prices compared to official prices in Paris

	Chocolat	Beurre	Huile	Café	Sucre
Fin 1945.....	7,5	3,3	7	5	9
Fin 1946.....	6,5	2	5	6	10
Fin 1947.....	5	2,5	5	5,5	6
Fin 1948.....	3	2	3	3	5

Source : INSEE 1958, p. 115

Michel David, an individual who undertook a comprehensive study of the black market, made a similar observation. He acknowledges the existence of multiple black markets yet notes: “Black market prices nonetheless exhibit a certain consistency, in the sense that in a single location (Paris, for example), they tend to stabilize at a similar level influenced by various factors, a level that varies little and is rarely exceeded” (David, 1945, p. 81).

To verify this information, we found a series of documents in the archives of the Ministry of Finance, specifically in the INSEE archives. One folder in this file contains approximately 80 sheets detailing legal, black, and free market prices for a series of products corresponding to the 34-item Parisian retail index³⁷. These records were all taken in Paris, across different arrondissements (15th, 4th, 17th, etc.). No additional information about these records has been obtained: it simply appears that INSEE sought to gain a clear understanding of the state of both legal and black prices and sent its agents to collect data between February 15 and 16, 1947. This date cannot be disconnected from the period of the Blum reductions that occurred in January 1947. It seems very likely that INSEE aimed to evaluate the effect of these reductions, both on legal prices (a 5% decrease) and on black market prices. We provide an example of these records with Figures A2.

Figure A2: Example of INSEE survey on Parisian black prices

³⁷ AEF H-0001382

PRODUITS Habituels	(3) PRIX	
	Taxé	noir ou(3) libre
Pain (le Kg).....	11 [°]	25 [°]
Farine courante (le Kg).....	18 [°]	<u>70[°]</u>
Boeuf: Plates-côtes (le Kg).....	139 [°]	
Faux filet (le Kg).....	240 [°]	
Tranche beefsteack (le Kg)	240 [°]	
Veau: Poitrine (le Kg).....	127 [°]	
Quasi désossé (le Kg)...	240 [°]	300 [°]

Source : AEF H-0001382

This series of records provides a high-quality source for obtaining a substantial amount of black prices for various products, in the same location and on the same date. It allows us to test the consistency of black prices. In Table A3, we present butter black prices recorded by the INSEE agents. Butter is an interesting product because it is subject to an intense black market due to its ease of concealment. Farmers are incentivized to convert their milk into butter as it is easier to transport and more profitable. Throughout the period, the supply services struggled greatly to ensure butter collection, while the black market thrived with this product. Another advantage of butter is that its quality does not vary significantly, making all butter relatively equivalent. This is not the case with soap, for example, whose qualities can vary greatly from one artisanal production to another.

Table A3: Butter price on Paris' black market

Price (kg)	600	625	650	700	800
Observation number	23	2	21	3	1

The results are impressive: out of 50 observations, the price of butter ranged between 600 and 650 francs per kilo 46 times. The three other prices at 700 francs represent an increase of less than 10%. This is far from the completely erratic prices that would primarily depend on a monopolistic seller's relationship with their buyers, subject to their whims. Equally notable, the prices mentioned here have not been rounded by us, implying that sellers refer to broad categories: butter sells at 600 or 650 francs, not at a price like 629 francs. In other words, these prices are standardized.

These observations are confirmed for other products as well. Consider the case of a standardized product where the quality difference is minimal within the product category: sugar. This product is subject to a much less intense black market at the retail level, primarily because its production process requires refining, making it easier to control. Black market supplies thus come from diversions or thefts, which are less straightforward than a simple transaction from a producer to an individual. Table A4 shows the prices of sugar from the 76

records found on the black market. Here, we observe a greater diversity of prices, or more precisely, the absence of broad price categories in increments of 50 francs. This might be explained by the fact that the price of sugar is, on average, half that of butter. Nevertheless, despite this diversity of retail prices, the overall price range remains coherent and relatively close to the average of 312 francs per kilogram. Specifically, 48 records note a price between 300 and 320 francs per kilogram. Even more striking is the standard deviation, which measures the average deviation that allows us to estimate the diversity of the data, standing at only 6.18%. In other words, even for a product with a less intense black market and greater price diversity, the discrepancies between these prices are remarkably small. Thus, there appears to be significant consistency in retail black prices, in the same location, on the same date.

Table A4: Sugar price on Paris' black market

Sugar price on black market		
	Price	Observations
	250	1
	275	1
	280	4
	285	1
	290	3
	295	2
	300	16
	310	11
	320	21
	325	5
	330	2
	340	3
	350	6
Average	312,17	
Standard deviation	19,29	
Standard deviation %	6,18	

This consistency of black prices in a single location raises questions: how can it be compatible with the existence of multiple channels and interpersonal relationships, which are a necessary corollary to a clandestine economy? Such multiplicity should not result in such clustered prices. The economist Pirou provides the most pertinent explanation, in our view. He acknowledges, like Grenard, that the clandestine nature of the black market explains why "the rule of price unity is often thwarted" (Pirou 1945, p. 387). Indeed, since the buyer cannot put the seller in competition, the seller will attempt to set the maximum price "based on all the information he can gather about the buyer's wealth, temperament, and desire for the object" (Pirou 1945, p. 388). This situation results in multiple black prices in the same location.

However, this unofficial and clandestine nature only characterizes the initial period of institutionalizing the black market, which could be described as a trial-and-error phase. During this first phase, individuals realize that access to the free market is no longer available and that official supplies will not be sufficient for survival. This institutionalization process typically

occurs in late 1940 and early 1941, when clandestine supply channels and practices are just beginning. This is why Jean Galtier-Boissière, a member of the Parisian bourgeoisie, considers 1941 to be the hardest year of the war, not because official supplies were lower than the rest of the war, but because the French had not yet developed the habits and organization for clandestine supply (Galtier-Boissière 1945).

But this phase only lasts for a while. With the institutionalization of clandestine supply, the market structure and prices evolve. As people gain experience with clandestine practices, they start to develop a better understanding of prices and the available supply opportunities, especially when these insights are shared through common experiences of seeking supplies. Thus, an unofficial pricing standard gradually forms, often resulting from conversations and oral information exchanges. This unofficial standard emerges from the information buyers share, which helps them determine whether they got a good deal and whether a price is outrageously high by comparing it with what their friends have paid.

This process is particularly effective for products that are common on the black market and standardized. For instance, butter, which is widely supplied through the clandestine market and purchased by many people, allows individuals to gather numerous feedback on the prices set by sellers, thereby delineating a range of existing prices for the same product in the same location. This price range is also influenced by newspapers, which frequently report on trafficker arrests, sometimes providing details on transaction prices, offering contemporaries precise information.

This widespread knowledge helps explain why black prices vary little from one another in the same location. Since all buyers are aware of the prices, for example, of butter paid by their acquaintances and reported in newspapers, they can check if the prices offered by their seller are not excessively high. This knowledge enables them to take measures to contest these high prices. The buyer can directly negotiate with the seller, relying on their awareness of prices set by other sellers. If the price remains too high, they can refuse the transaction and purchase the desired product from other sellers.

Access to these competitors can be facilitated through the buyer's social connections, but they can also visit certain streets known to be hotspots for black market activity. Finally, and unique to this period, the buyer can punish their seller more severely through a logical process in the context of clandestine exchange: denunciation. The *Contrôle Economique* receives numerous denunciation letters, some of which come from dissatisfied buyers seeking to harm their seller. The seller then faces the possibility of being sent to an internment camp, a highly undesirable outcome.

A similar argument is developed by economist Max Cluseau, who conducted an in-depth study of the black market in Toulouse at the beginning of the war. He noted that the black market for milk was characterized initially by low prices, barely exceeding the official rates. The only exceptions were during periods of shortages (winter 1941-42) or when the seller dealt with a stranger unfamiliar with local prices. Most of the time, milk producers were reluctant to raise their prices due to the nature of the milk market in the region, where producers had a network of regular customers to whom they delivered milk regularly. This modesty in milk prices allowed the producer to sell other products at higher prices. "Milk then becomes a sort of bonus, with the primary focus of the market shifting to chicken, vegetables, and eggs. The apparent generosity of the producer regarding milk camouflages or compensates for the high prices of the main market items in the buyer's mind" (Cluseau 1943, p. 68).

But why go through the trouble of appeasing customers' sentiments when the seller is in a strength position? Besides the risk of denunciation, Cluseau provides another argument: "As the milkman often serves his longstanding clientele, he hesitates to be too demanding. A day will come when he needs to return to the city, where his products will no longer be in high demand. On that day, if he has taken advantage of the situation, the old customer may take their revenge" (Cluseau 1943, p. 68). This objective of customer loyalty is one of the stabilizing forces preventing continuous price increases.

The combination of factors pushing prices up (scarcity, income increases, risk premiums) and factors limiting prices (fear of denunciation, customer loyalty, awareness of an average price) creates a black market rate that sellers can hardly deviate from without exposing themselves to additional risks. Thus, contemporaries could report black market rates in a location that they considered fairly general. For example, Galtier-Boissière confidently announced that the price of a stolen bread card in Paris was 300 francs in September 1943 (Galtier-Boissière 1945, p. 185). This knowledge of black market rates was so widespread that some newspapers published black price listings. For instance, *La Vie Française* published quarterly black market rates. The issue of October 11, 1946, published "with the usual reservations and for informational purposes, our quarterly black market price list" is reproduced as Figure A3³⁸.

Figure A3: *La Vie française* quarterly black market price

Notre vœu est de pouvoir ne plus jamais publier de « cote du marché noir », et de renvoyer nos lecteurs aux cotes libres des Halles et du commerce non clandestin.

Détail à Paris	Avril	Juil.	Oct.
Beurre (1 k.).....	550	490	550
Huile (1 l.).....	600	525	600
Lait (1 l.).....	22	20	20
Cacao (1 k.).....	400	400	600
Chocolat (1 k.)...	600	575	600
Café (1 k.).....	600	575	600
Thé (1 k.).....	1.000	1.000	1.500
Sucre (1 k.).....	250	325	350
Riz (1 k.).....	500	600	600
Haric. secs (1 k.)	40	50	50
Confitures (1 k.)..	150	160	160
Vin ordin. (1 l.)	120	100	120
Camembert (unité)	80	60	70
Lait cond. (1 b.)	120	120	110
Cigarettes (20 g.)	65	80	80
Essence (1 l.)....	55	70	70

Source : Archives Banque de France ABF 0011199901 AR 14

The relative price unity that quickly emerged during the war allows for the possibility of creating a consistent black market price index over the period. Three conditions are necessary to maintain price unity. First, the analysis must be conducted in a single geographical location throughout the entire period so that a common black market rate exists and individual transaction prices do not deviate significantly from this rate. Second, it is essential to distinguish between the black market and the friendly market: information on the conditions of these markets can be found in contemporary testimonies and, for example, in the circumstances of the arrest of offenders. Therefore, we will focus here on black market prices and derive an average price for the friendly market. Finally, we will concentrate on retail prices.

³⁸ ABF 0011199901 AR 14. The file contains other black price listings published by newspapers, such as *La Vie Française* on September 22, 1945, and *Combat* on July 6, 1948.

We therefore created a retail black market price index for Paris. The choice of Paris is based on two justifications. First, we aim to replicate the INSEE 34-article index, which is Parisian; hence, it makes sense for our index to also focus on Paris. The second justification is that Paris, being the largest French city, significantly increases the availability of reports, arrests, newspapers, and testimonies that can describe black prices. This makes Paris the location where we can obtain the most data on the black market. This characteristic is crucial because studying a clandestine market is challenging, and collecting precise information over an extended period can prove to be a significant obstacle.

Appendix 4 – The 68 newspapers used in black prices research

Newspaper name	Server	Location (department)	Start-End years	Periodicity
L'Abeille de Fontainebleau	Gallica	Fontainebleau (77)	1840-1944	Weekly
L'Action Française	Retronews	Paris (75)	1908-1944	Daily
Au Travail	Retronews	Chambéry (73)	1940-1944	Weekly
Aujourd'hui	Retronews	Paris (75)	1940-1944	Daily
L'Aurore	Retronews	(Clandestine)	1943-1945	?
Bulletin municipal officiel de la Ville de Paris	Gallica	Paris (75)	1882-1985	3 issues p. week
Candide : grand hebdomadaire parisien et littéraire	Gallica	Paris (75)	1824-1944	Weekly
Carrefour	Retronews	Paris (75)	1944-1951	Weekly
Ce Soir	Retronews	Paris (75)	1937-1951	Daily
Combat	Retronews	Paris (75)	1941-1950	Daily
Le Courrier de l'Ouest	Retronews	Angers (49)	1944	Daily
Le Cri du peuple de Paris	Retronews	Paris (75)	1940-1944	Daily
La Croix	Retronews	Paris (75)	1880-Today	Daily
Les Dernières Dépêches	Retronews	Dijon (21)	1945-1958	Daily
La Dépêche du Berry	Retronews	Vierzon (18)	1893-1944	Daily
Les Echos	Gallica	Paris (75)	1928-Today	Daily
Les Etoiles	Gallica	Paris (75)	1943-1946	Weekly
L'Événement	Retronews	Paris (75)	1881-1951	Daily
Femmes françaises	Gallica	Paris (75)	1944-1953	Weekly
Force Ouvrière	Retronews	Paris (75)	1945-1951	Weekly
Le Franc-tireur	Gallica	Paris (75)	1944-1953	Daily
France	Retronews	Londres	1941- ?	
France Amérique	Retronews	New York	1943-1947	Weekly
La France au travail	Retronews	Paris (75)	1940-1941	Daily
La France de Bordeaux et du Sud-Ouest	Retronews	Bordeaux (33)	1887-1944	Daily
France Europe	Retronews	Paris (75)	1942-1944	Weekly
La France Nouvelle	Retronews	Paris (75)	1945-1951	Weekly
La France socialiste	Retronews	Paris (75)	1941-1944	Daily
France-Europe	Retronews	Paris (75)	1942-1944	Weekly
France-soir	Retronews	Paris (75)	1941-2011	Daily
La Gazette de Biarritz-Bayonne et Saint-Jean-de-Luz	Retronews	Biarritz (64)	1893-1944	Daily
La Gazette Provençale	Retronews	Avignon (84)	1940-2002	Daily
Germinal	Retronews	Paris (75)	1944-1944	Weekly
L'Indépendant de Seine-et-Oise	Gallica	Corbeil (78 / 91]	1880-1944	Weekly
L'Italie Nouvelle	Retronews	Paris (75)	1923-1944	Weekly
Le Journal	Retronews	Paris (75)	1892-1944	Daily
Le Journal d'Aubervilliers	Retronews	Aubervilliers (75 / 93)	1946-1949	Weekly
Journal des débats politiques et littéraires	Retronews	Paris (75)	1814-1944	Daily
Journal officiel de la République française	Retronews	Paris (75)	1868-Today	Daily
Les Lettres françaises	Retronews	Paris (75)	1942-2019	Weekly
L'Humanité (clandestin)	Retronews	Unknown	1940-1944	Weekly
L'Économiste européen	Retronews	Paris (75)	1892-1971	Weekly

Le Matin	Retronews	Paris (75)	1884-1944	Daily
Les Ondes	Retronews	Paris (75)	1941-1944	Weekly
L'Organisation	Gallica	Paris (75)	1936-1974	Monthly
L'Ouest Eclair	Retronews	Rennes (35)	1899-1944	Daily
Paris-midi	Gallica	Paris (75)	1911-1944	Daily
Paris-municipal : défense des droits de Paris	Gallica	Paris (75)	1895-1944	Weekly
Paris-Presse L'Intransigeant	Retronews	Paris (75)	1944-1970	Daily
Paris-turf : France libre	Gallica	Paris (75)	1945-1970	Daily
Le Pays libre	Retronews	Paris (75)	1936-1944	Bimonthly
Le Petit Courrier	Retronews	Angers (49)	1883-1944	Daily
Le Petit Parisien	Retronews	Paris (75)	1876-1944	Daily
Le Petit Troyen	Retronews	Troyes (10)	1881-1944	Daily
La Petite Gironde	Retronews	Bordeaux (33)	1872-1944	Daily
Le Phare de la Loire	Retronews	Nantes (44)	1844-1944	Daily
Le Populaire	Retronews	Paris (75)	1916-1970	Daily
Le Progrès de la Côte d'Or	Retronews	Dijon (21)	1869-1944	Daily
Le Progrès de la Somme	Retronews	Dijon (21)	1869-1944	Daily
Regards	Retronews	Paris (75)	1933-1960	Weekly
La Résistance ouvrière	Retronews	Unknown	1944-1945	Weekly
Le Réveil du Nord	Retronews	Lille (59)	1889-1944	Daily
Le Temps	Retronews	Paris (75)	1861-1942	Daily
La Tribune de l'Aube	Gallica	Troyes (10)	1901-1942	Daily
Vie Française	Archives Bank of France			
La Vie ouvrière	Retronews	Paris (75)	1909-1993	Weekly
L'Œuvre	Retronews	Paris (75)	1904-1944	Daily

Source: Gallica and Retronews. Information retrieved June 3rd, 2024.

Appendix 5- Estimating the share of illegal market

5.1. The legal distribution of food in Paris

Knowing the amount of food a family officially received requires precise knowledge of the goods distributed in Paris by the rationing services. These differ from the theoretical rations planned by the government, which were very rarely fully distributed. More importantly, it involves knowing the monthly distributions of each product to compare them to the actual consumption by families. To do this, we had to account for the diversity of situations. Indeed, an individual weekly ration varies depending on the age, occupation and gender of the rationed individual. While the categories and their names changed over time, one can look at the example of January 1945. At this time, rationed individuals were divided among E (ages 0 to 3 years), J1 (ages 3 to 6 years), J2 (ages 6 to 13 years), J3 (ages 13 to 21 years), and finally A (adults over 21 years). Each category was entitled with different quantities, with adolescents in the J3 category receiving the most nutritious diet, save for heavy load workers. In the detail, a category E gets more milk while an A (adult) receives a ration of wine that babies do not... but that J3s do receive³⁹. And at least for a while, all adults received a tobacco ration, which furnished the non-smokers with a convenient barter item.

The INH has kept very precise statistics on the goods distributed monthly to rationed individuals in Paris⁴⁰. As such, we can know the official distributions of each food product that took place during the period (Figure A4). Combined with the surveys conducted by Lucie Randoin, it thus becomes possible to discern the quantities of products consumed that exceeded the officially distributed rations, and thus must have originated from outside the legal framework. This allows us to estimate a proportion of legal versus illegal market activity. This capability allows us to retrospectively identify whether a particular product was subject to an active black market or not. We discover, for instance, bread was a product for which black market quantities were significantly small when compared to rationing supply. Conversely, products like meat were subject to a more active black market.

Figure A4: Legal food distribution in Paris for adults, February 1945

³⁹ It is important to note that there are a few additional categories: one for breastfeeding women, who are entitled to more milk, and another for heavy labor workers. This latter category refers to workers engaged in particularly physical labor, who generally receive extra rations of bread. For simplicity's sake, we have not accounted for these additional categories: all adults are grouped into the A category. This leads to a slight underestimation of the official supply in our data. However, this underestimation is offset by two factors. First, even if supplies are officially distributed in Paris, local shortages may prevent some families from receiving their full ration. Thus, if the grocery store where a family is registered faces a supply disruption, the family may not be able to properly receive its ration. Second, and more importantly, the surveys conducted by Randoin are self-reported, which leads some participants to likely minimize their consumption for fear that it might be a trap set by the Contrôle économique to catch them in the act. The surveys thus contain households consuming quantities significantly lower than those provided by the rationing system, which is improbable in a context of semi-famine.

⁴⁰ These data are compiled from 1942 to 1948. Archives nationales 19770621/7.

TAUX DES RATIONS PAR JOUR POUR LE MOIS DE MAI 1945
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CATEGORIES A & T

Ration minimale prévüe par jour	Grammes		Protides		Lipides		Calories	Ration cal. allouée
			A	V	A	V		
Pain.....	350,--	182,--	-	27,65	-	3,85	871,50	
Viande (II,6	8,70	-	1,10	-	1,06	-	14,06	
Charc.....	2,90	-	0,53	-	0,29	-	4,33	
Saindoux.....	6,45	-	-	-	6,38	-	57,46	
Beurre.....	3,22	-	-	-	2,65	-	23,98	
Margarine.....	6,45	-	0,01	-	5,35	-	48,50	
Fromage.....	3,87	0,10	0,09	-	1,03	-	13,62	
Sucre.....	16,12	16,12	-	-	-	-	64,48	
Total.....		198,22	2,73	27,65	16,76	3,85	1098,53	1098,53
Tickets va lois: au crs du mois								
Fêtes.....	32,25	23,86	-	4,19	-	0,45	116,42	
Légumes secs.....	8,06	4,03	-	1,93	-	0,08	24,58	
P.de terre.....	80,64	11,77	-	1,37	-	-	52,41	
Cons.améric.....	12,90	1,29	1,16	-	0,64	-	15,60	
Oeufs.....	3,22	0,02	0,36	-	0,32	-	4,46	
Confitures.....	8,06	6,85	-	0,05	-	-	27,64	
Cons.légumes.....	32,25	7,74	-	2,09	-	-	39,34	
Choc.américain..	3,61	1,89	-	0,18	-	1,15	18,69	
		57,45	1,52	9,81	0,96	1,68	299,14	299,14
		255,67	4,25	37,46	17,72	5,53	1397,67	1397,67
Vin.....	161,29	28,22	-	-	-	-	112,90	112,90
TOTAL GENERAL:		283,89	4,25	37,46	17,72	5,33	1510,57	1510,57

Archives Nationales 19770621/7

The slight challenge is that not all household members are entitled to the same amount of food. Therefore, it is necessary to replicate the amount of food each age group is entitled to and weight these amounts by the number of people in each age group according to the Randoin survey.

Let's take an example using the Excel sheet "illegal vs. legal quantities" and the "food legally received" sheet. In March 1945, adults (category A or M depending on the period) were entitled to 350 grams of bread per day. Young children, on the other hand, were only entitled to 250 grams of bread per day. Therefore, it was necessary to consider the household composition in the Randoin surveys. Among the 105 people studied by Randoin, 60 were adults and 5 were young children. To determine the average consumption of the sample studied by Randoin, we weight the amount of food each category is entitled to by the proportion of that category in the sample. Thus, the 350 grams of bread for adults account for 60/105 of the average bread received per person. This allows us to observe that in the sample studied by Randoin in March 1945, an average of 351 grams of bread was distributed per individual. This quantity will be compared to the quantities actually consumed by the sample studied by Randoin.

The "food legally received 1944" sheet uses the same methodology but for the year 1944.

The "age categories in 1944" sheet helps determine each age category (and thus the proportion of food each household member is entitled to). The INSEE (1947) survey is not precise enough in breaking down children's ages. Official rationing recognizes three age categories between 0 and 13 years: E (ages 0 to 3 years), J1 (ages 3 to 6 years), and J2 (ages 6 to 13 years). However, the INSEE survey has only one category: children from 0 to 13 years.

Therefore, to determine the proportion of each category, we assume that each age group has roughly an equivalent number of children. We apply the following proportions: E represents 20% of all children, J1 represents 30%, and J2, which covers the largest number of child ages, represents 50% of the total.

5.2 Real Consumption and Calculation of Legal/Illegal Market Proportions

As explained in the main text, to determine the proportion of products exchanged on illegal markets, we use the consumption surveys conducted by Lucie Randoin, comparing the results with those of foodstuffs legally distributed by the rationing services. The difference between the two (actual consumption minus legal consumption) allows us to identify consumption from illegal sources.

The sheet “real consumption” provides the actual consumption of Parisian households. As we have explained, the calculations from 1944 based on INSEE (1947) survey are treated the same way as our calculations from Lucie Randoin's surveys. Let's follow the reasoning with an example.

In March 1945, the Randoin surveys found that the daily egg consumption for the entire studied population was 1277 grams per day. Given that the studied population consisted of 105 people, the average actual consumption per person was 12.16 grams of eggs per day. Additionally, our calculations established that the studied population had received a legal supply of 4.60 grams of eggs per day through rationing. The ratio between actual consumption and legal consumption allows us to determine illegal consumption. In March 1945, illegal egg consumption represented 62% of total egg consumption.

In the main Excel table, to calculate an average price for eggs, we apply a weight of 38% to official prices, and distribute the remaining 62% of illegal transactions between the black market and the grey market according to a ratio detailed in the section “Black Market Quantities / Grey Market Quantities”.

5.3. Black Market Quantities / Grey Market Quantities

The survey conducted by the predecessor of INSEE, the Service National des Statistiques (SNS), between 1942 and 1944 and published in INSEE (1947) is extremely useful for determining the share of the grey market and the average prices practiced there. Conducted throughout France, the survey aimed to determine the share of production that was self-consumed, the share of the official market, the share of the grey market, and the share of the black market.

In the sheet “Quantities on black-grey market” two tables are presented. Table 1 is a simple reproduction of the data from the survey published by INSEE (1947). The statistics include the self-consumption of peasants. Table 1 eliminates this factor to focus on the proportion of the black market and the grey market. Thus, the table indicates that, excluding self-consumption, 22% of all transactions took place on the black market and 17% took place on the grey market.

At the last line of the table, we calculate the average of all the products compiled by the SNS. We use these averages to compare the share of the black market with that of the grey market. The results indicate that, on average, for the whole France, the quantities exchanged on the black market represent 1.21 times the quantities exchanged on the grey market. Considering that this ratio changes relatively little, we apply this ratio to the entire period from 1941 to 1948.

5.4. Black Market Prices / Grey Market Prices Ratio

The SNS survey also allows us to accurately determine the average prices of transactions on the black market and grey market throughout France between 1942 and 1944. The sheet “Black-grey prices” provides the results. For instance, in 1942, butter was sold at an average price of 61 francs per kilo on the grey market and 194 francs per kilo on the black market. Thus, the black price of butter is on average 3.18 times higher than the grey price. We apply these calculations to each product, and the average ratio of black prices to grey prices shows that black prices are on average 2.07 times higher than grey prices. Similar to the quantities, we consider this ratio of 2 to be relatively stable and apply it to the entire period.

5.5. Evaluate the Quantity of Illegal Market Meat for Each Type

One of the weaknesses of the Randoin surveys is that they do not specify exactly which type of meat is consumed. Therefore, we only obtain a general proportion of illegally consumed meat. However, the INSEE 34-item index includes several types of meat: veal, mutton, pork, and beef. What is the proportion of the illegal market for mutton? For beef?

The survey conducted by the SNS between 1942 and 1944 provides interesting details about the illegal market for each type of meat. Although Paris is not included in the surveys, two major cities are: Marseille and Lyon. While Marseille is a poorly supplied city with a significant black market and high prices, the black market is less strained in Lyon. Therefore, we consider that simultaneously taking both cities into account provides a good estimate of what happens in Paris.

The Excel sheet “meat illegal market” details, based on the SNS survey, the proportion of meat bought illegally for each meat category. For example, in the Rhône department in 1944, 60% of pork was sold on the black market, and 25% on the grey market. By averaging the statistics from Lyon and Marseille, we arrive at an illegal market proportion of 86% for pork, whereas it is only 39% for beef.

Our hypothesis is that these ratios change little over the period because they reflect general characteristics of these types of meat. For instance, pork is known to be easy to preserve, making its transport less complicated than that of beef. This ease of transport explains why pork is structurally more likely to be traded illegally. The proportion of the illegal market for delicatessen meats in 1944 is derived from the consumption survey conducted by the SNS in 1944 (real consumption sheet).

A second issue arises for us: in August 1945, chicken was deregulated. This means that part of the meat consumption did not originate illegally but was purchased on the free market. Fortunately for us, in 1946, INSEE and the Scientific Society of Food Hygiene conducted surveys using the same methodology as those conducted by Randoin. However, they were more precise as they differentiated chicken consumption from the consumption of other types of meat.

In the Excel sheet “Chicken proportion”, we reproduce the results obtained by Girard (1947 and 1948). These results allow us to determine the proportion of chicken consumption relative to the total meat consumption.

The “Meat illegal market final” sheet allows us to utilize all these results. The column “Meat illegally consumed” includes the results we obtained from the Randoin surveys. It records the proportion of meat consumed by households outside of what was provided by rationing.

The column “Meat illegally consumed taking freedom of chicken into account”, as its name indicates, deducts chicken consumption from the households' illegal meat consumption. Thus, in the second quarter of 1945, both columns show the same proportion of meat consumed illegally since chicken had not yet been deregulated. Conversely, in the third quarter of 1945, accounting for chicken reduces the proportion of illegally consumed meat from 45% to 40%.

Finally, we can calculate the proportion of the illegal market for each type of meat. Let's continue with the example of chicken. The SNS survey showed us that 77% of chicken was sold on illegal markets, while on average, 70% of meat was sold illegally. Therefore, we can deduce the illegal market for chicken from the overall illegal market by multiplying the latter by 1.1.

Thus, in the first quarter of 1945, illegal meat consumption represented 72% of the total meat consumption. Using this ratio, we can estimate that the illegal consumption of chicken was approximately 79%.