Neither Black nor White: the Paris Clandestine Gold Market during World War Two

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Abstract

This article shows the complex nature of the clandestine gold market in Paris during World War II. This market was indeed neither black nor white. It was “white” in the sense that trades of three different gold coins were conducted on a daily basis. The occupying forces as well as the French police had a perfect knowledge of this market but tolerated it most of the time. During the whole war period, an active arbitrage with Switzerland existed with high profit for speculators. This active arbitrage led to a weekday effect on gold prices in Paris. On the other hand this market was also “black” as it was illegal to trade in gold and legislation against black markets had impact on gold prices by a law passed in June 1943. Even though prosecution of traders existed during the whole war, it was much more frequent after the Liberation of Paris in August 1944 since requisitioned gold went to the French government, and not the German one, after this date.

\textit{JEL classification:} G1, N2

\textit{Keywords:} Paris clandestine gold market, World War II, Swiss arbitrage, weekday effect, repressions, event tests

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1. Introduction

Black markets are both fascinating and frustrating to analyse: fascinating because they are a spontaneous answer to some prohibition; frustrating because they are elusive, there are few data (if any) and no archives so that it is difficult to analyse them rigorously. By definition, black markets share a common feature: they are legally prohibited. The extent to which wrongdoers are prosecuted may however vary dramatically. Practices may range from intensive repression to laissez-faire. In the first case, data are almost impossible to get whereas in the last case one may question to which extent actors on the market consider they infringe the law. In occupied France, the whole range of practices co-existed. There was however a gradual change in the intensity of prosecution. Grenard (2012) distinguishes three phases. The first months of the Occupation saw the creation and expansion of black market networks. Black market operations which were at first only conducted by a limited number of persons gradually became the norm.\(^1\) By the second half of 1941, almost the whole population was to some extent involved in black market activities for food. This forced the French government to prosecute only the major actors. In the third and last phase, beginning in 1943, the German occupation forces took a more active stance in prosecuting black marketers. The willingness to rationalize the exploitation of occupied France and to limit resistance movements explain the harsher approach taken by the occupying forces and the French collaborationist government up till the Liberation of Paris in August 1944.

The case analysed in this paper, the black market on gold in occupied Paris, is unique in many respects. Indeed, it is, to our knowledge, the only black market for which daily prices are available during the Occupation. The exceptional nature of the data is worth stressing as the norm is usually to consider that black market is “inaccessible to quantification” (Sanders, 2008, p. 137). This is certainly true for data on black markets for food or clothes, which are scattered and at best provide only an impressionistic view of the workings of these markets. The limited frequency of these data prevents running robust statistical analysis. By contrast, daily prices are available for three gold coins (napoleon, sovereign and double-eagle) traded

\(^1\) Food rationing was imposed on September 23, 1940, leading to an increase in black market activities.
on the Paris black market during the 1941-1948 period. This exceptional database reflects the unique position of this black market which was for most of the war tolerated. German archives show indeed that this market was not so “black” since the German army knew very well its existence, tolerated it and even traded on it. As for the French police, it also knew the existence of this market but intervened on the market only now and then and mostly after the Liberation of Paris in August 1944. As a matter of fact, even at the height of German and French repression of black market activities (after 1943), the German occupying forces acted as observer or actor on this market but almost never threatened its existence. The market was thus neither totally black nor really tolerated. It was of course officially forbidden but trades never stopped even though repression-wise the market experienced periods of high and low (or no) repression.

The lack of reliable data has prevented analysing the price formation process on black markets. The limited literature on this topic has been mostly concerned with informational efficiency. For example, Gupta (1981), Booth and Mustafa (1991), Huett et al. (2014) show that clandestine markets in foreign currencies are usually efficient. By contrast, Gallais-Hamonno et al. (2015) find that the Parisian black market in gold during World War II was not efficient. Even though these analyses shed light on an important characteristic regarding price formation on clandestine markets, many questions remain unanswered. This paper sets out to answer two of these. First, how do prices on the black market react to laws affecting the sanctions related to clandestine activities? And are effective sanctions related to price changes? Second, are prices on the black market affected by international arbitrage? In other words, do prices converge with prices observed in other countries despite the illegal character of the market?

To analyse these questions, this article is organized as follows. Section 2 presents the Paris black market on gold during World War II using archives from both the German occupation forces and the French authorities which shed a new light on the workings of this market. Section 3 discusses the impact of international arbitrage with Switzerland on the gold price in Paris whereas Section 4 shows how changes in legislation and repression affected prices on the black market. Section 5 concludes.

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2 The recent analysis on gold also concerns the role of gold as a safe haven investment (Baur and McDermott 2010, Beckmann et al. 2015, Hoang et al. 2015).
2. The “Black and White” Market in Gold

As is usually the case, the Paris black market for gold was born from prohibition. Indeed, just after the declaration of war, an Order in Council (décret-loi) of September 9, 1939, established controls on gold and foreign currencies. Article 3 of this law focused on gold and stated that: “Any trading and operations on gold need to be authorized by the Banque de France. Imports and exports of gold are prohibited except if it is approved by the Banque de France.” Furthermore, following this new law, French people could only sell their gold to the Banque de France or to an authorized commercial bank at official prices: 47,608 French francs (FF) per kilo of fine gold, 274.49 FF for a napoleon coin, 346.16 FF for a sovereign coin and 71.13 FF for one gold-dollar in the double-eagle coin. These prices remained unchanged during the whole war period. Of course, these official prices did not reflect the strong demand for gold and were therefore much lower than the ones observed on the black market. As a concession to the public, the law allowed that sellers would remain anonymous if they officially sold their gold at the Banque de France.

Transactions on gold were extremely limited during the Phoney War as gold holders were probably willing to keep their gold should they have to flee the country. The speed of the French defeat took everybody by surprise, leading to a mass exodus in June 1940. After the Armistice, it took several months for the Parisian population to come back home (Alary, 2010). Ordinary life resumed its course in the fall of 1940, as shown for example by the reopening of the Paris Stock Exchange in October 1940. This reopening coincided with the imposition of strict rules. The Coulisse (the Parisian equivalent of the curb) remained however closed. In view of the important number of Jewish brokers active on this market, the Coulisse was a natural target for the occupying forces (Oosterlinck, 2010). During the winter 1940, some of the brokers who were no more officially allowed to trade, started gathering Place de la Bourse and - as the American “wet feet” - they would begin to trade gold from the street kerb or preferably in some cafés. At the beginning of 1941, a form of decentralized market with trade taking place “face to face” had thus emerged and was functioning with success in cafés around the Exchange.

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3 The American double-eagle coin was priced for only one dollar but its whole price was 20 times the quoted price, meaning 71.13 FF times 20, or 1422.60 FF (more details below).
4 In some respects, this market presents some similarities with the 19th century “Coulisse.” The “Coulisse” too was prohibited but trades took openly place under the Stock Exchange columns and even within the building. They mostly traded small French and foreign stocks which were prohibited from the “official” market (Pollin, 2007).
The market was “opened” daily from Monday to Friday and until April 1941, even sometimes on Saturdays. According to De Litra (1950, p39 sqq) six assets were traded on a regular basis: three gold coins\textsuperscript{5} and three foreign currencies (the British Pound Sterling, GBP; the American Dollar, USD and the Swiss Franc, CHF). In a somewhat exceptional fashion for a black market, several sources provide prices for the assets traded on this market. This paper is based on the stupendous database of daily quotes coming from a pamphlet\textsuperscript{6} published in 1950 by De Litra & Cie (hereafter, De Litra), a merchant company trading in gold and precious metals. This firm was established just before the war, in 1938. The pamphlet is made of two parts: The first part is an analytical history of the price of gold coins during the war and the first years of the Fourth Republic; the second part is the daily quotes of the six assets presented above from February 3, 1941 to January 31, 1948, that is just before the opening of a legal market for gold on the Paris Stock Exchange.\textsuperscript{7} Unfortunately, the pamphlet neither discusses the way the firm traded during the German Occupation nor how the prices were collected. The accuracy of the prices is however confirmed, by cross-checking these prices with those mentioned in four alternative sources: the archives from the Banque de France (BdF thereafter), the German occupation forces, a French businessman and a French economist.

The Banque de France had a direct interest in the clandestine market since it was the main actor of the official trade in gold. A document\textsuperscript{8} from the “Secrétariat du Conseil Général” shows that prices made on the market were almost public. Indeed, the document states that “The quotes of “currencies and gold coins” priced outside the (official) market “in the street” are available in the daily reports on the Stock Exchange.”\textsuperscript{9} Apparently, an employee from the BdF was in charge of collecting each day the prices of gold coins from this source.\textsuperscript{10} These

\textsuperscript{5} 20 FF napoleon, [6.4516 grams with 5.806 grams of fine gold], 20 Sh sovereign, [7.988 grams with 7.322 grams of fine gold], 20$ Double-Eagle, [33.437 grams with 30.093 of fine gold]. Vigreux (1947) mentions an important trade in Swiss Vrenelis after 1946.
\textsuperscript{6} This pamphlet was discovered by one of the authors, Mrs Hoang, at the Bank of France’s Archives while writing her PhD thesis. Unexpectedly, this firm still exists at the same address in Paris, Avenue Victor Hugo, one of the wealthiest streets in Paris but its website indicates a different business: “Financial Assistant” (“Auxiliaire Financier”).
\textsuperscript{7} Readers may refer to Hoang (2012) for more information on the official market for gold in Paris from 1948 to 2004, in French.
\textsuperscript{8} BDF, 309-a
\textsuperscript{9} In French: Les cours pratiqués « devises et monnaies d’or » en dehors du marché « dans la rue » sont indiqués dans les Rapports de Bourse journaliers ».
\textsuperscript{10} The authors thank heartily the Archives’ members for searching traces of these documents.
daily reports do not seem to have survived. However three documents\textsuperscript{11} providing a synthesis of these prices still exist. These documents cover different periods and different coins but all included, they provide 727 price quotes for a period ranging from January 1942 to November 1947.

The German occupation forces also monitored the prices on the black market. A German analysis of this market dated April 1944 and entitled “Political Determinants of the Gold Price on the Black Market in Paris in 1943”\textsuperscript{12} (hereafter, German note) lists the monthly high and low prices on 30 dates for a period ranging from November 1942 to March 1944. According to its author, the market was well organized, the business was safe and the prices were uniform and firm. Whereas for other goods traded on black markets, the price to pay could vary substantially,\textsuperscript{13} for gold trade, it was done at the quoted price. This analysis not only provides price data but also suggests the events leading to sharp price changes. Eventually, it also mentioned the international arbitrage with Belgium and Switzerland.

The diary of the French businessman, Pierre Nicolle, is another source for gold prices. Pierre Nicolle acted as the “go-between” for small and large firms on the important issue of the new industrial organization promoted by the Vichy Regime (Dard, 1998). Nicolle was well connected with Pierre Laval and after 1942, he spent time in Paris on a regular basis. His diary, published in 1947, reports the evolution of the double-eagle coin on 25 dates.

Last but not least, data are also reported in the oldest French economic journal, La Revue d’Economie Politique. Before the war, this journal published every year a survey on the French economy detailing the main economic and social events which had taken place the preceding year. Because of the Occupation, the publication of the survey stopped during the war but a special issue covering the years 1939 to 1946 was issued in the last quarter of 1947. The chapter dedicated to the exchange market was written by Professor Vigreux. Unfortunately, Vigreux (1947) does not disclose his sources but his article presents the monthly averages for each of the three gold coins from February 1941 to June 1947.

\textsuperscript{11} BdF-36, “Quotes of the gold coins (black market), March 1943-March 1945”; BdF-309-1“Quotes of the French “LOUIS” (napoleon) in the unofficial market”; BdF-309-2, Clandestine quotes of gold coins and foreign currencies in Paris.
\textsuperscript{12} ANF, AJ40/831-3, Politische Bestimmungsgründe des Goldpreises am Schwarzen Markt in Paris im Jahre 1943, Deutsches Institut für Wirtschaftsforschung, Paris im April 1944.
\textsuperscript{13} For example, the author mentions that for butter, prices could vary from 300 to 700 French francs per kilo on a given day.
Table 1 displays the correlation coefficients between De Litra’s data and the other sources. The correlation coefficients speak for themselves: they are extremely high, over 0.98 with the exception for the sovereign with Vigneux’s data (0.914). As one can expect, the coefficients for the period after the Occupation are slightly better than those during the Occupation: on average 0.995 versus 0.991. Several elements are worth noting. First, the high correlation leaves little doubt about the reliability of the De Litra data. Second, the existence of minor differences confirms that the sources are indeed different suggesting that getting the black market value of gold was not so hard during the Occupation. This was explicitly mentioned in the German note: even though the quotes were not published, anyone wishing to find them could easily do so. This easiness to find gold prices may be the reason why we do not find any explanation on how they were collected in all the mentioned sources. Third, De Litra’s data seemed to be of higher quality. Indeed, unlike other sources where the quotes were rounded up to ‘5’ or ‘0’, in De Litra’s, all digits from 1 to 9 were used, even sometimes downed to decimals (e.g., 1/4, 1/2, 3/4). Eventually, the way the prices were recorded in De Litra warrants a mention. Prices for the napoleon and the sovereigns were given for a coin. For the American double-eagle coin however, De Litra followed the convention used for the American commodities futures markets. Only a fraction of the total weight of this coin was quoted. As the 20$ double-eagle coin was too “big” (33 grams), i.e., 5 times the napoleon coin weight, its quote was indicated for only one dollar. Thus, the price of the whole coin was 20 times the indicated quote.

According to the German note, clandestine transactions in gold could take place everywhere. Bodin (1946) confirmed this information for the post-war period and mentioned that clandestine transactions occurring in banks’ offices, travel agencies, real estate agencies, jewellery stores, hair or massage salons as well as in bars, night clubs, or restaurants... Gold traders also exploited the fact that American soldiers were paid by check which could only be used in the USA. Traders on the clandestine gold market accepted to buy these checks with a 25% discount and then went to the USA to cash them and came back with the USD or gold. Profits from these operations could rise up to 200,000 or 300,000 FF for each Paris-New York travel. As for smaller smugglers, called “dressers of the gold clandestine trade,” they sold gold coins around the Stock Exchange and in the “Faubourg Poissonnière.” It was estimated that these “small smugglers” got a profit of 150 FF per napoleon (which costed about 4000 FF in that period).
Table 1: Correlation between prices from De Litra (1950) and other sources

<table>
<thead>
<tr>
<th>Source</th>
<th>Period</th>
<th>Observations</th>
<th>Gold coins</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vigreux (1947)</td>
<td>02/1941-06/1947</td>
<td>75 (monthly)</td>
<td>Napoleon, Sovereign, Double-eagle</td>
<td>0.984, 0.914, 0.983</td>
</tr>
<tr>
<td></td>
<td>Total period, 02/1941-01/1948</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BdF-309-1</td>
<td>01/1942-08/1944</td>
<td>63 (daily)</td>
<td>Napoleon</td>
<td>0.996</td>
</tr>
<tr>
<td>BdF-36a</td>
<td>03/1943-08/1944</td>
<td>346 (daily)</td>
<td>Sovereign, Double-eagle</td>
<td>0.995, 0.984</td>
</tr>
<tr>
<td>Nicolle's note</td>
<td>1942-1944</td>
<td>25 (daily)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>German note</td>
<td>11/1942-03/1944</td>
<td>30 (daily)</td>
<td>Napoleon, Double-eagle</td>
<td>0.995, 0.986</td>
</tr>
<tr>
<td></td>
<td>Occupation period, 03/1943-08/1944</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BdF-309-2</td>
<td>06/1946-11/1947</td>
<td>140 (daily)</td>
<td>Napoleon, Double-eagle</td>
<td>0.998, 0.999</td>
</tr>
<tr>
<td>BdF-36b</td>
<td>09/1944-09/1945</td>
<td>146 (daily)</td>
<td>Sovereign</td>
<td>0.992</td>
</tr>
<tr>
<td>BdF-309-1</td>
<td>09/1944-12/1945</td>
<td>32 (daily)</td>
<td>Napoleon</td>
<td>0.991</td>
</tr>
<tr>
<td></td>
<td>After the Occupation period, 09/1944-01/1948</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In view of the number of prices reported by different sources, the clandestine nature of the gold market may be questioned. According to De Litra (1950, p. 41), in 1940, the occupier tolerated and even participated in the market in order to get foreign currencies and gold taking advantage of the overvaluation of the Reichsmark.14 Germans were even considered as being the biggest buyers of bars and ingots. The occupation forces were in fact monitoring the market in such a way that they were able to analyse price changes for the various coins. This remained so even after 1943 when the German occupation forces began to take a more active stance to limit black markets. Had the German military Authority governing Paris wanted to stop the market? It could easily have done so. One or several raids around the Stock Exchange would have been sufficient. But they preferred to tolerate it because it served their purposes. Sanders (2001) stressed indeed that for some goods, such as gold, silver or platinum, the Germans needed an active black market. The 20-marks gold coins were never traded on the Paris clandestine market due to the very strict prohibition to export this coin (De Litra, 1950, p. 42). According to De Litra (1950) a German soldier caught in possession of a 20-mark gold coin outside Germany would have been executed. Eventually, De Litra (1950) further suggested that the favourite coin for German buyers was the US double-eagle.

According to the German note, the Frenchs were both buyers and sellers. As buyers, they would invest some of their savings in real assets, or they would have “small” items of great

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14 After the Armistice, the exchange rate of the Reichsmark was set at 20 French francs, representing an overvaluation of at least 40%.
value such as gold. The demand for small portable goods in occupied Paris has been documented elsewhere (Oosterlinck, 2013). Jewellers were also buying the precious metals required for their trade on the black market. As sellers, bourgeois or retired persons would need to get some cash just in order to be able to live because inflation was eroding their purchasing power.\textsuperscript{15} In any case, the amounts held by Frenchmen were substantial. Just after the war, the quantity of gold hoarded by French people was estimated at 3,500 tons, twice the official reserve of the Banque de France at that time\textsuperscript{16}. By contrast this figure was estimated at 2,320 tons in 1939. The sharp increase in gold hoarding reflects the high demand for gold during the war. A great part of this demand came from speculators who were exploiting the price differential with Belgium and Switzerland to conduct international arbitrage activities. The supply was however irregular and often influenced by political and administrative reasons, for example stricter border controls or limitation in terms of transportation, according to the \textit{German note}. This note also mentioned that foreigners were sometimes also active on this market as was the case of Italians during the summer of 1943. Actors on this market came thus from diversified horizons and had different motivations to buy gold. There is unfortunately no direct way to measure the relative importance of each type of buyers. One way to assess the relative importance of German versus French buyers is to compare prices of the favourite coin of each category of buyers: the double-eagle for Germans and the napoleon for Frenchs as explained below.

Several sources (Nicolle, 1947 and De Litra, 1950) mentioned the interest Germans had for the US double-eagle. No archival evidence has been found explaining why the Germans would favour this coin over the British sovereign or the French napoleon. One may conjecture that they were indifferent to the nationality of the issuer but preferred larger coins as for a similar gold content, it would have been easier to carry one double-eagle instead of five napoleons. Alternatively, they may have preferred US coins either because they associated French coins with a declining economy or because they believed that the double-eagle would be easier to exchange in some countries should Germany lose the war. These are of course only conjectures and these reasons need not be mutually exclusive. Nicolle (1947) further suggested that on the other hand, Frenchmen preferred napoleons. A cultural reason may easily explain this preference as Frenchmen were more familiar with this coin than with the

\textsuperscript{15} 39\% per year from 1941 to 1948 according to the French National Institute for Statistics (Insee).
US one as it had been used as a currency in the last gold standard in France between 1803 and 1914.$^{17}$

In any case, if the market participants were indifferent to the coin itself, then the value of one gram of fine gold should be similar across all coins. Surprisingly, this was not the case. Figure 1 depicts the ratio between the price of one gram of fine gold contained in a napoleon coin over the price for the same quantity of gold contained in the double-eagle coin.$^{18}$ If fine gold is viewed as equivalent in all gold coins, then the ratio should be equal to 100%.

**Figure 1: The ratio of the napoleon premium to the double-eagle premium**

![Graph showing the ratio of the napoleon premium to the double-eagle premium]

From February 1941 to February 1943, the double-eagle traded systematically at a premium to the napoleon since the ratio was lower than 100%, with a differential reaching 10% on some dates. This suggests that the demand of the double-eager was higher than that of the napoleon from February 1941 to February 1943. This analysis is thus consistent with the observations made by Vigreux (1947, p. 1058) and Nicolle (Nicolle, 1947, volume 2). Indeed, if Germans were eager to buy double-eagle coins, then this graph would tend to suggest that they were very important actors on the black market up till the spring of 1943. Between February and July 1943 however, the French napoleon overtook the double-eagle. This increase in demand for the French coin coincided with a sharp decline on the equity market.

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$^{17}$ Hoang (2011) provides additional elements on this point.

$^{18}$ We also analyzed the ratio between napoleon and sovereign. The price of one gram of fine gold in a napoleon was systematically higher than the one in the sovereign in most of the time. This shows that demand for sovereigns was lower than that for napoleons or double-eagle coins. More information about this analysis is available upon request.
(Oosterlinck, 2010). The starting point of this decline in the market may be linked to a series of law passed in February 1943. These laws forced the registration of securities and capped the daily price increases for any security. As a result investing on the stock exchange became less interesting and agents may have decided to invest in gold instead. In this case, the increase in demand for the napoleon would be due to the rebalancing of portfolios following the new legislation. By July 1943 and up till the Liberation of Paris in August 1944, the double-eagle traded again at a premium. This observation is consistent with contemporaneous observations. Indeed according to De Litra (1950, p. 47), the prospects of military defeat prompted the Germans to buy gold and currencies at any price and this especially after the Allied landing in Normandy in June 1944. It was only in January 1945 that the napoleon overtook the double-eagle, an observation in line with expectations if Germans indeed favored double-eagles and Frenchmen napoleons.

The previous elements give the impression that the market in gold was hardly a black market and that trading in gold on the clandestine market did not entail any specific risk. This was certainly the view of the Germans according to the author of the German note stating that the market was well organized and the business was safe. It was however not the case for Frenchmen. Delarue, (1968, p. 41) mentioned the activities of French collaborationists who exploited the illegal nature of gold trade to trick potential sellers and confiscate their gold. According to him, these operations would have led to confiscation of four tons of gold during the war. However, Delarue (1968) did not provide any source to back up his statements. In any case, even if the German authorities tolerated this black market, the French government passed a series of law increasing the sanctions for people engaging in black market activities. Prosecution of wrongdoers also increased over time. This point will be analysed in the next section which focuses on the behaviour of gold prices faced to changes in legislation and on the evolution of repression on gold trade in the understudy period.

### 3. The legal framework related to gold trade

During the first part of the war, the occupying forces played an important role in the development of black markets. Major suppliers of black markets were in fact eager to sell to Germans as they both had the means and the ability to protect them if needed (Grenard, 2012, p. 42). It is therefore little wonder that by the end of 1940 many black market activities were conducted in the open. The German demand was such that a special service was created to
transfer goods bought by soldiers to their families (Grenard, 2012, p. 47). In the fall of 1940, the German forces set up several agencies to buy goods in France. The most famous one was the bureau Otto,¹⁹ which quickly developed a network enabling it to find goods of interest for Germans. By the beginning of 1941, the bureau Otto had more than 400 employees and worked intensively with French intermediaries. The increasing frustration of the French population led to harsh criticism of the Vichy regime. These criticisms forced the regime to act and in spring-summer 1941, repression increased. Judges, considered as too lenient by the regime, were summoned to be more severe (Grenard, 2012, p.104). On March 21, 1941, a new court was created to judge black market activities. It was replaced by a more powerful court (Tribunal d’Etat) on September 7, 1941. According to Grenard (2012, p.115) the judgments given by the Tribunal d’Etat were extremely harsh, life imprisonment being commonly pronounced for the main actors on black markets.

By the end of 1941, the extreme conditions had forced most of the French population to become involved on black markets. The minor deals were described as part of the “grey market” but it is safe to say that almost the whole population was in fact acting outside the limits of legality. This evolution forced the government to be more tolerant towards the small offenders. A new law passed on March 15, 1942 made a clear distinction between the grey and the black markets. Illegal activities conducted to survive were considered as different from those done with profits as main purpose. For important black marketers, the new law meant higher potential prison sentences. Following this law, prosecution focused on important actors, leaving more or less aside minor offenders. According to Grenard (2012, p. 191), the state of repression influenced prices with actors requiring a premium when the risk was the highest.

During the first years of the Occupation, the German forces had an ambiguous position regarding black markets: They were officially forbidden but in practice tolerated because they could be used to acquire goods. This position shifted at the end of 1942 when a more rational policy to exploit occupied France was set into place (Grenard, 2012, p. 231). The plundering policies engineered by Goering were replaced by a planned exploitation set into place by Albert Speer. Black markets were from then on viewed as playing against the German victory. German activities on the market were dramatically reduced and some German soldiers were

¹⁹ From the nickname of its founder Hermann Brandl.
even court-martialled for their involvement in these markets. From 1943 on, only select groups of Germans could still buy on this market in total impunity. The French collaborationist government followed the impetus given by the Germans and increased prosecution even further. Direct actions by Gestapo became more and more frequent. During the first semester of 1943 the _Devisenschutzkommando_ arrested a series of traders on black markets (Sanders, 2001, p. 271). A new law passed on June 8, 1943 strengthened even more the potential sentences faced by black marketers. The _Milice française_\(^{20}\) also entered the game and, to impress the general public, made a series of highly-publicized arrests. In parallel, resistance movements started legitimizing black markets and presented their actions as a way to resist the invaders.

Over the course of the war the French government thus passed many laws to increase the repression on black market activities. These laws did not specifically target the black market in gold but black markets in general. In view of the position of the German authorities, market participants may have expected that these laws would not really be implemented on the clandestine gold market. In other words if market participants felt that the police would keep a blind eye on their activities, then one would not expect any market reaction when the laws were passed. To test if the changes in the legal framework for clandestine markets had an impact on the clandestine gold market, we rely on a so-called event study focusing on the market reaction following the adoption of the three main laws:

- The law passed on September 7, 1941: black market activities will be judged by a Tribunal d’Etat
- The law passed on March 15, 1942: prosecution focused on important actors, leaving aside minor offenders.
- The law passed on June 8, 1943: strengthened more the potential sentences faced by black marketers.

The three above-mentioned dates will be considered as our event dates.\(^{21}\) The event window will cover the period \([-10, 0, 10]\), including 10 days before the event date and 10 days after. The estimation window is 140 days before the event window for the first event date (as our sample period begins only on February 3, 1941). As for the 2\(^{nd}\) event date, the estimation

\(^{20}\) The _Milice française_ was a French paramilitary organization created by the Vichy regime to fight against resistance movements.

\(^{21}\) For more information about event studies, see MacKinlay (1997).
window is 252 days before the event window and it is 247 days for the 3\textsuperscript{rd} event date. This choice is consistent with the idea of MacKinlay (1997) which is to use about 250 trading days prior to the event window.

We use the constant mean return model (also called the mean adjusted return model) following which the abnormal returns in the event window is calculated by the difference between the observed and the expected rates of return. This latter is the average rate of return over the estimation window. In the absence of any daily market index, it is impossible to compare the results with the ones we would have obtained by using a market model. This is probably not an issue as Brown and Warner (1985) showed that the mean adjusted return model provides similar results as the market model in most of cases. To test the significance of the abnormal returns, we use the t-student test for which the null hypothesis is “there is no abnormal return within the event window” while the alternative hypothesis is “presence of abnormal returns within the event window”. All technical aspects of these tests are presented in the Appendix of the paper. Table 2 provides the results of the tests.

\textbf{Table 2: Descriptive statistics of the abnormal returns and their significance}

<table>
<thead>
<tr>
<th></th>
<th>Law of September 7, 1941</th>
<th>Law of March 15, 1942</th>
<th>Law of June 8, 1943</th>
</tr>
</thead>
<tbody>
<tr>
<td>\textbf{Napoleon}</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.0041</td>
<td>0.0006</td>
<td>-0.0089</td>
</tr>
<tr>
<td>SD</td>
<td>0.0119</td>
<td>0.0092</td>
<td>0.0184</td>
</tr>
<tr>
<td>t-statistic</td>
<td>1.5782</td>
<td>0.3113</td>
<td>-2.2200**</td>
</tr>
<tr>
<td>\textbf{Sovereign}</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.0045</td>
<td>-0.0003</td>
<td>-0.0062</td>
</tr>
<tr>
<td>SD</td>
<td>0.0134</td>
<td>0.0096</td>
<td>0.0182</td>
</tr>
<tr>
<td>t-statistic</td>
<td>1.5437</td>
<td>-0.1268</td>
<td>-1.5678</td>
</tr>
<tr>
<td>\textbf{D-eagle}</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.0024</td>
<td>-0.0005</td>
<td>-0.0100</td>
</tr>
<tr>
<td>SD</td>
<td>0.0126</td>
<td>0.0085</td>
<td>0.0181</td>
</tr>
<tr>
<td>t-statistic</td>
<td>0.8843</td>
<td>-0.2490</td>
<td>-2.5330**</td>
</tr>
</tbody>
</table>

Note: This table presents the mean, standard deviation (SD) and the t-statistic of the abnormal returns of the three gold coins in the event window. ** means that the average value of the abnormal returns is significantly different from 0 at the 5\% level of confidence. All the calculations are presented in the Appendix.
The two first laws did not have any significant impact on gold prices. Apparently up till 1943, market participants did not believe that the laws would affect them. This is consistent with the view that at the beginning of the Occupation, the clandestine gold market functioned as a tolerated market. This result also suggests that the clandestine gold market functioned in a different way than other clandestine markets (for example clandestine food markets). According to the German note, price changes on the gold market had a direct influence on the prices of other goods (coffee, consumption goods but also securities) traded on black markets. This may be explained by the fact that gold could be used to buy other assets or goods, the reverse being not true. Results are different however for the third law passed on June 8, 1943 which had a negative and significant impact on prices of napoleon and double-eagle coins, but not the sovereign, at the 5% level of confidence. The absence of reaction for the sovereign may be due to liquidity (the other two coins being the most liquid). Furthermore, the fact that both the double-eagle and napoleon saw an abnormally sharp price decrease suggests that both German and French participants reacted to the law, if we follow Nicolle (1947) and De Litra (1950). This observation is in line with expectations since this law followed the will of the German authorities and even German participants may have felt that infringing the law could have serious consequences. Indeed, as pointed out by Sanders (2008), these deals were illegal even by German standards. As for the Frenchmen, the June/1943 law was the most severe one and the increasing implication of the French Milice in the repression did certainly not go unnoticed.

After the Liberation of Paris in August 1944, the position of the Free France regarding gold warrants a mention. De Litra (1950) and various documents from the archives of Banque de France mention the following laws passed between 1944 and 1948. The first decree dealing with the requisition of all gold and foreign currencies located abroad and belonging to French residents was passed in May 1944 by the National Council in Alger. On October 7, 1944, a decree prohibited transportation and exchange of gold. This decree provided that gold could only be held as personal jewels and could only be sold to the Banque de France. All moral persons had to deposit their gold at the Banque de France or in accredited institutions. Otherwise, their gold would be confiscated. On January 17, 1945, a new decree was passed in order to inventory gold held by Frenchmen. All the population, not only moral persons this

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22 In February 1948, gold trade became free thanks to the efforts of the Finance Minister at the time, René Mayer. For more information about this event, please refer to Hoang (2011).
time, had to declare its gold holdings. Intermediaries, such as banks, brokers or accredited financial institutions, had to declare gold coins, bars, ingots, foreign currencies, checks, credit letters, bills, commercial papers and foreign values stored in France for their own accounts or those of their clients. After that date, they had to declare all changes related to these accounts. On December 26, 1945, a new decree replaced the one passed in May 1944 in Alger. Following this decree, the government had the right to requisition gold, foreign currencies and foreign securities and real estate goods situated abroad and owned by French residents.

Legislation by itself may also have a limited impact if the implementation of the law was minimal. It is unfortunately impossible to get a precise picture of the prosecution conducted against black marketeers. On basis of restricted files held at the French National Archives, one may however gain some insights regarding the repression of illicit trade in gold. Table 3 (in Appendix) details the number of penal files related to clandestine operations on gold and foreign currencies to be found in the French National Archives. Since a large part of black marketeers escaped prosecution, these figures are of course lower bounds. Unfortunately, there is no file for period June 1940-August 1943. The statistical elements should therefore be taken with a grain of salt.

For the whole period 1939-1951, the number of cases related to gold (352) was much higher than the ones concerning foreign currencies (191). Even though, the sample size is relatively small, the evolution of the number of files is in line with observations made by contemporaneous actors. Indeed, both Vigreux (1947) and De Litra (1950) indicated an increase in clandestine gold trades during the Phoney War in 1940. The same holds for the end of the war. Bodin (1946) mentioned that the French police was more active in the hunt against gold smugglers after the Liberation of Paris in August 1944. He attributed the zeal of the French police to a change in the nature of end-beneficiary of the seized gold. Before the Liberation of Paris, the requisitioned gold went to the German authorities, while after the Liberation it ended up in the coffers of the French government. Also according to Bodin (1946), after the war, there was a very large network of smugglers and arrests occurred on a weekly basis. Bodin (1946) estimated however that only 5% of clandestine gold was seized by the 22 police sections devoted to gold and currencies smuggling in France. According to Bodin (1946), only the Paris section requisitioned 87 kilos of gold with 400 arrests in 1945. In

23 Except when the weight was under 20 grams and for personal jewels
24 ANF, BB/18/7080-BB/18/7107.
the same period, the Financial Police of the Prefecture of Paris requisitioned 120 million FF of gold and foreign currencies. For the 1st quarter of 1946, this number was 40 million. According to documents found in French National Archives, a high number of penal files concern clandestine operations conducted from Lyon. This may be related to the proximity with the Swiss border. Black market activities continued even after February 1948, when gold trade became free again in France. This may be explained by the remaining prohibition of gold imports and exports and by the perceived lack of anonymity of gold trades on the official market at its opening (Hoang, 2012). Overall, table 3 shows that there was a real risk to trade gold clandestinely. This risk increased substantially after the Liberation of Paris.

The files also provide anecdotic evidence on the nature of the trades and on the way smugglers or black marketers were treated when caught. The importance of the trades varied greatly. In some instances, the amount involved were extremely small with the illegal sale of one gold coin leading to an arrest,25 while in others, hundreds of coins were seized.26 In most cases, the coins were either confiscated or a fine had to be paid. In some instances, offenders were jailed without parole.27 Fraud seems to have been ubiquitous and several files mention fake gold ingots. For example, on June 19, 1944, three fake ingots were seized in Paris with the buyer prosecuted for illicit gold trade and the seller for swindle.28 In other cases, when the deal was about to be concluded, buyers pretended to act in the name of the occupation forces and seized gold.29 In many cases, the arrests were made near the borders by people willing to exploit the price differences between Belgium or Switzerland and France. For example, in February 1941 an employee of the French national train company (SNCF) was arrested at the Belgian border with 3,000 USD and fined 213,396 FF.30 The amounts involved in international arbitrage could be extremely substantial. In March 1945, the police seized, close to Lyon, 300,000 gold coins coming from Switzerland.31 In July the same year, twelve smugglers from Switzerland were arrested in possession of 25,000 napoleon coins. Smuggling from Switzerland or Belgium lasted well after the war and mentions were still found at the beginning of the 1950s.

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25 For example in Poitiers on October 12, 1944 one person sold one 10 French francs gold coin and was prosecuted. ANF, BB/18/7084- 6-BL-219. During the Occupation the same was also true, on October 28 1943, M. sold 5 gold coins to G. The coins were seized, ANF, BB/18/7084- 6-BL-144.
26 ANF, BB/18/7082 6-BL 220.
27 ANF, BB/18/7082 6-BL 143.
28 ANF, BB/18/7082 6-BL 178.
29 ANF, BB/18/7082 6-BL 178.
30 ANF, BB/18/7082 5-BL 92.
In view of the number of mentions on smuggling operations from Switzerland, one is left wondering to which extent this international arbitrage affected gold prices in Paris. It is what we will analyse in the next section.

4. International arbitrage in a clandestine market

When it comes to international trade, Switzerland was the principal gold provider for France (German note 1944; De Litra, 1950; Vigreux, 1947). The Swiss authority estimated that 200 tonnes of gold were sold in Switzerland from 1941 to 1946 and 80% of which was bought by French people. In 1946, the daily quantity of gold sold in Switzerland was 200 kilos on average and about 60 tonnes for the entire year. This extremely high value occurred despite the measures set into place by the Swiss government.

Starting in the summer 1941, Switzerland began to limit the quantity of gold transactions (De Litra, 1950). However, there was no official measure against gold import and export. In August 1941, the Swiss government restricted the quantity of gold sold to private buyers. The Swiss National Bank (Banque Nationale Suisse, BNS hereafter) sold gold bars only to businesses (jewelers for example) at a fixed price of 4,970 Swiss francs per kilo. The BNS also asked commercial banks to sell gold only to Swiss residents. Despite these informal measures, the clandestine export of gold surged. The gold trade was only officially regulated from December 7, 1942 on. Three main points of that law may be stressed: 1, No gold transaction could be carried out without an authorization; 2, Import and export of gold were subject to a written authorization; 3, All gold transactions were subjected to a tax of 8%. In fact, the BNS wanted to stop selling gold coins to limit speculation. Thus, from December 7, 1942 on, one could buy or sell gold only through an approved intermediary, which was subjected to a tax of 2% on his turnover (De Litra 1950, p. 44). Moreover, the BNS imposed an upper price limit for all kinds of transactions, inside or outside the country: 4,970 CHF per kilo of fine gold, 30.5 CHF per napoleon, 38.45 CHF per sovereign, 7.9 CHF per dollar in the double-eagle coin. The new law led to the emergence of a black market in gold in Switzerland.

33 Source: Notes B-115-3 on December 10 and 11, 1942, of the “Direction Générale des Services Etrangers” of the Banque de France, archives of the Banque de France.
Following the *Interim Report* of the “Independent Commission of Experts Switzerland – Second World War” (2002), between 1943 and 1944, the BNS bought an important quantity of gold coins (5,033,000 coins), stolen in Belgium and the Netherlands by Germany, from the *Reichsbank*. The price of one coin was 28.1 CHF and the BNS paid 141 million of CHF in total to the *Reichsbank*.\(^3^4\) For the whole war period, the quantity of gold bought by the BNS from the *Reichsbank* amounted to 4.3 million USD. The resulting increase in the stock of gold coins of the BNS prompted it to resume selling gold to the market again. On November 1, 1946, the Federal Authority and the BNS decided to remove all the existing restrictions. By that time, the gold reserve of the BNS had jumped from 2,100 million CHF in 1940 to 4,895 million in 1946 (De Litra 1950, p. 54). Since the country needed foreign currencies, selling gold seemed an appropriate course of action. In total, during the war, the BNS sold on the market gold equivalent to 547 million of CHF, out of which 456 million were gold coins.

Also in the interim report (2002) of the above mentioned commission, a graph was showing the evolution of prices of three gold coins (sovereign, napoleon, and Swiss Vreneli) traded by Swiss banks from 1940 to 1942.\(^3^5\) Prices of napoleons varied between 25 and 35 CHF while those of sovereign ranged between 35 and 50 CHF. The price differential reflected the difference in weight of fine gold contained in these coins (5.806 vs. 7.322 grams, respectively). Despite the absence of the original series, it is possible to assess the averages for each coin on basis of the published graph. These averages are compared in Figure 3 with the ones computed for Paris on basis of the data from De Litra. For the sake of comparison, the Parisian averages are converted into Swiss francs using the exchange rate prevailing on the clandestine market, also available in De Litra (1950).

**Figure 3: Comparison between gold prices in Switzerland and in Paris from 1941 to 1942 (in CHF)**

\(^{34}\) Following this report, page 99, the *Reichsbank* had a gold inventory in Berne. In the autumn of 1941, the *Reichsbank* brought gold from the Netherlands to Berne for an amount of 562 million CHF. The BNS bought 400 million worth of this stock.

\(^{35}\) The authors of this report were unfortunately not allowed to give the data used to construct this graph.
On average, prices in Paris were substantially higher than in Switzerland. Indeed, during the same period (01/1941-09/1942), prices of napoleon varied between 20 CHF and 30 CHF in Switzerland while they were between 35 CHF and 45 CHF in Paris. For the sovereign, the figures are respectively 35-45 CHF for Switzerland and 45-55 CHF for Paris. Prices of gold coins in Paris were thus about 10 CHF higher than those in Switzerland. Smuggling had thus a theoretical margin of about 30%. The existence of an important price difference for the same products in two different markets suggests that the law of one price did not hold for gold coins during the Second World War.

In the absence of continuous series for Switzerland, it is impossible to analyse the price differences on basis of high frequency data. Fortunately, the archives of the Banque de France contain detailed monthly prices of gold coins traded in Switzerland during the second semester of 1942 (from June 1 to December 7, 1942). This data allows calculating precisely profits from the Swiss arbitrage for this period. According to the German note, gold coins were usually brought from Switzerland during the weekends when there was less control at the borders. They were then sold in Paris on the first days of the week after. Thus, in a first pass, we consider that gold coins bought in Switzerland were sold two days later in Paris. However, to take into account the uncertainty regarding smuggling activities, and as a robustness test, we also calculate arbitrage profits if the trip took three, four or five days. Eventually, we consider two scenarios, one in which the French speculator already had CHF at the beginning of his operation (Panel A) and one in which he first needed to convert his French francs into Swiss francs (Panel B). Results are reported in Table 4.
Table 4: Profit from the arbitrage with Switzerland

<table>
<thead>
<tr>
<th></th>
<th>A. In CHF</th>
<th></th>
<th></th>
<th>B. In FF</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Napoleon</td>
<td>Sovereign</td>
<td>D-eagle</td>
<td>Napoleon</td>
<td>Sovereign</td>
<td>D-eagle</td>
</tr>
<tr>
<td>2 days Average</td>
<td>22.80%</td>
<td>15.65%</td>
<td>21.92%</td>
<td>22.53%</td>
<td>15.35%</td>
<td>21.62%</td>
</tr>
<tr>
<td>SD</td>
<td>7.78%</td>
<td>6.92%</td>
<td>8.75%</td>
<td>9.25%</td>
<td>7.42%</td>
<td>9.47%</td>
</tr>
<tr>
<td>3 days Average</td>
<td>21.91%</td>
<td>14.77%</td>
<td>23.18%</td>
<td>23.71%</td>
<td>16.41%</td>
<td>23.17%</td>
</tr>
<tr>
<td>SD</td>
<td>6.60%</td>
<td>6.38%</td>
<td>8.21%</td>
<td>10.91%</td>
<td>9.63%</td>
<td>11.88%</td>
</tr>
<tr>
<td>4 days Average</td>
<td>21.70%</td>
<td>14.50%</td>
<td>22.21%</td>
<td>23.74%</td>
<td>16.39%</td>
<td>24.18%</td>
</tr>
<tr>
<td>SD</td>
<td>6.36%</td>
<td>5.18%</td>
<td>8.33%</td>
<td>11.60%</td>
<td>10.18%</td>
<td>12.16%</td>
</tr>
<tr>
<td>5 days Average</td>
<td>21.63%</td>
<td>14.43%</td>
<td>22.11%</td>
<td>23.78%</td>
<td>16.42%</td>
<td>24.20%</td>
</tr>
<tr>
<td>SD</td>
<td>6.54%</td>
<td>5.30%</td>
<td>8.44%</td>
<td>11.63%</td>
<td>10.18%</td>
<td>12.16%</td>
</tr>
</tbody>
</table>

In general, results are robust to the number of days considered to resell the coins. Returns are broadly similar for a given coin and this independently of the number of days. They change, however, substantially in function of the coin under consideration. Sovereigns offered the smallest return (between 14% and 16%) while napoleons and double-eagles were in a higher range (21% to 24%). The higher profit margins for these two coins probably reflected the German and French interest for the double-eagle and napoleon, respectively. The returns for these arbitrage operations were huge considering that the profit came in only a few days and this during a period which was favorable for smugglers. As mentioned above, before December 7, 1942, gold was still easy to buy in Switzerland. This finding explains the importance of arbitrage operations with Switzerland and the numerous mentions of these in the press. Of course, these results do not take into account the costs and risks associated with this venture. Evidence from a later period would tend to indicate that the costs paid to cross the border were small compared to the coins’ value. The main cost was however not direct but the risk of being caught, of getting the coins confiscated and of course of being jailed.

Evidence from our analysis on the profit of the Swiss arbitrage tends to indicate that it was very profitable. However, despite this active arbitrage, prices remained different and there was no convergence of prices in the two markets. One could thus wonder how this arbitrage impacted on gold prices in Paris. Indeed, according to the German note a substantial part of

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36 Following a document found in the Archives of the Banque de France, no 1467200501/33, a note of the “Direction Générale des Services Etrangers” on August 8, 1958, the “passage cost” for a clandestine operation was about $3.3 per kilo.
the smuggling activities took place on weekends when there was less control at the borders. As a result, the first days of the week were characterized by a large inflow of gold coins leading automatically to a price decrease those days. To test this assertion, we compare the returns of gold coins in function of the weekdays of the trade. To better identify this effect, we base on two different periods: the whole period (1941-1948) and a sub-period with only 1941 and 1942. This sub-period choice is based on the law passed on December 7, 1942. The results are presented in Table 5, Panel A for the whole period and Panel B for 1941-1942.

Table 5: Weekday effect on the Paris clandestine market for gold

<table>
<thead>
<tr>
<th></th>
<th>Panel A: Whole period</th>
<th>Panel B: Only 1941 and 1942</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Napoleon</td>
<td>Sovereign</td>
</tr>
<tr>
<td>Return</td>
<td>Monday</td>
<td>13.26%</td>
</tr>
<tr>
<td>SD</td>
<td>42.05%</td>
<td>40.83%</td>
</tr>
<tr>
<td>Return</td>
<td>Tuesday</td>
<td>12.17%</td>
</tr>
<tr>
<td>SD</td>
<td>43.84%</td>
<td>40.60%</td>
</tr>
<tr>
<td>Return</td>
<td>Wednesday</td>
<td>12.05%</td>
</tr>
<tr>
<td>SD</td>
<td>43.01%</td>
<td>40.51%</td>
</tr>
<tr>
<td>Return</td>
<td>Thursday</td>
<td>12.59%</td>
</tr>
<tr>
<td>SD</td>
<td>44.57%</td>
<td>41.29%</td>
</tr>
<tr>
<td>Return</td>
<td>Friday</td>
<td>14.03%</td>
</tr>
<tr>
<td>SD</td>
<td>42.84%</td>
<td>42.10%</td>
</tr>
</tbody>
</table>

Note: Mean and s.d. (standard deviation) are in annualized values, estimated by multiplying the weekly values by \( \sqrt{52} \) respectively. Following the results of comparison tests between two time series (t-test, F-test, and Kolmogorov-Smirnov test), there was a significant difference between Mondays and Wednesdays (the variance of returns of the three coins), between Tuesdays and Wednesdays for the napoleon and Wednesdays and Thursdays for the double-eagle, only in the 1941-1942 period.

There was no significant difference between the days of the week for the whole period (Table 5, Panel A). Panel 5B however shows that the rates of return on all assets were much higher in the 1941-1942 period than during the whole period (about 55% vs. 12%). This may confirm our analysis following which arbitrage was more active in 1941 and 1942. Furthermore, we find that the rates of return of the first days of the week (Mondays, Tuesday, and Wednesdays) were lower than the ones of the last days of the week (Thursdays and Fridays) in the 1941-1942 period (about 54% vs. 58%). This would tend to confirm that most of the coins that came from the borders during the weekends were sold on the first days of the
week after. This thus gives credence to the analysis in the German note. Our finding also completes this analysis and shows that this weekday effect was true only for years 1941 and 1942, before that Switzerland imposed restrictions on gold sales.

5. Conclusion

This article shows the complex nature of the clandestine gold market in Paris during World War II. Our archival and quantitative analysis reveals that this market was indeed neither black nor white. First, this market was not so black since the Occupant knew very well its existence but tolerated it and even traded actively on it. As for the French police, it only began controlling this market actively after the Liberation of Paris in August 1944. Apparently, up till 1943, market participants did not believe that the laws increasing sentences for black market activities would affect them. An event-study shows that this changed in June 1943 when a new law was passed and repression by the occupation forces increased. Second, on basis of an exceptional database providing daily prices of three gold coins (napoleon, sovereign and double-eagle), we show that demand for two of these coins fluctuated in function of the war evolution. Indeed, German buyers favoured the double-eagle and Frenchmen the napoleon. By analysing the price differential for one gram of gold within a napoleon or a double-eagle, we are able to assess the extent of trading done by the occupying forces. Third, we document and analyse the arbitrages with Switzerland. Profits from arbitrage were extremely high and even the massive transfers of gold from Switzerland to France were not enough to make the prices on both markets converge. During the first years of the Occupation, arbitrage was such that it had a direct impact on gold prices in Paris. Since most smugglers were active during the weekend, supply in gold increased during the first days of the week leading to a price decrease in the first days of the week after and a weekday effect on gold prices in Paris.

This weekday effect also leads to the rejection of informational inefficiency of the Paris clandestine gold market and confirms the findings of Gallais-Hamonno et al. (2015).
References

ARCHIVES

ANF: French National Archives (Archives Nationales de France)
- Deutsches Institut fur Wirtschaftsforschung – Abteilung Paris:
  - Politische Bestimmungsgründ des Goldpreises am schwarzen Markt in Paris in Jahren 1943. April 1944, 10 pages.
  Shelfmark: AJ/40/831-3
- German Institute of Economic Research, Paris Department:
  - Political determinants of the gold price at the black market in Paris in 1943
  Reference: “German Note”

BDF: Archives of the Banque de France
- Caisse Générale (Service des Espèces) : « Cours des monnaies d’or (marché noir), mars 1943-mars 1945 ». (Daily quotes with some missing data).
  Shelfmark: 1280200801, Box 36. References: 36-a and 36-b.

BOOKS AND ARTICLES

Dard, O., 1998. La synarchie ou le mythe du complot permanent, Paris : Perrin
(Pamphlet published by the company itself and available at the Banque de France’s Archives).


APPENDIX I

Table 3: Number of penal files found in the French National Archives on gold and currency clandestine operations from 1939 to 1951

<table>
<thead>
<tr>
<th>Dates</th>
<th>Paris</th>
<th>Province</th>
<th>Lyon</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gold</td>
<td>Currencies</td>
<td>Gold</td>
</tr>
<tr>
<td>November 11 to December 31, 1939</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>January to May 1940</td>
<td>18</td>
<td>8</td>
<td>42</td>
</tr>
<tr>
<td>From June 1940 to August 1943:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing files</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>September to December 1943</td>
<td>1</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>1944</td>
<td>34</td>
<td>3</td>
<td>43</td>
</tr>
<tr>
<td>1945</td>
<td>4</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>1946</td>
<td>5</td>
<td>4</td>
<td>34</td>
</tr>
<tr>
<td>1947</td>
<td>5</td>
<td>10</td>
<td>33</td>
</tr>
<tr>
<td>January 1948</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1948: February-December (freedom</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>on gold trade since February 1948)</td>
<td>5</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>1949</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>1950</td>
<td>5</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>1951</td>
<td>2</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>41</td>
<td>219</td>
</tr>
<tr>
<td>% of total files (543)</td>
<td>14%</td>
<td>8%</td>
<td>40%</td>
</tr>
</tbody>
</table>

Total: 543  On gold: 352  On currencies: 191

APPENDIX II: Event study methodology

1. Time line
   - As we already explained above, the event date is the same day as the day when the law passed in the Parliament.
   - For the event window, we choose a 10 days gap (before and after the event) because we think that 10 days may be sufficient for the information to be disseminated and to be known by the public.
   - For the estimation window, we choose the 1 trading day period with about 250 trading days.

2. The calculation of the abnormal returns

Without any daily market index for the study period (1941-1948), we can only use the mean adjusted return model which is the follows:

\[ R_{t,j} = \mu_t + e_{t,j} \Rightarrow e_{t,j} = R_{t,j} - \mu \Rightarrow AR_{t,j} = R_{t,j} - \mu \]
With $\mu_i$ is the expected return that we estimate by the average return of 250 days prior to the event window, $AR_i$ is the abnormal return of asset $i$ on date $t$, $R_i$ is the real rate of return of asset $i$ on date $t$ within the event window.

3. **T-test on the significance of the abnormal returns**

To test the significance of the abnormal returns, we use the t-test statistic which is calculated as follows:

$$t = \frac{\bar{AR}}{SE}$$

With $\bar{AR}$ is the average of the abnormal returns, $SE$ is the standard error which is calculated by $SE = \frac{SD}{\sqrt{n}}$ where $SD$ is the standard deviation and $n$ is the number of observations in the event window. It is 21 days in our case.

Finally, for the significance of the test, we just need to compare the test statistics with the critical values of the Student distribution at 1%, 5% and 10% with 20 degrees of freedom (20 = n-1). They are 2.84, 2.08 and 1.72 respectively.