

Original article

Effectiveness of investing in war bonds

Włodzimirz Szkutnik* , Tomasz Wyluda 

Faculty of Economics, University of Economics in Katowice, Poland,

e-mail: wlodzimirz.szkutnik@ue.katowice.pl; wyluda@op.pl

INFORMATION

Article history:

Submitted: 14 November 2019

Accepted: 30 June 2020

Published: 15 June 2022

ABSTRACT

When facing the threat of war, one of the critical decisions the authorities are obliged to take concerns war finance. The most common methods are taxation and debt. The work addresses financing war through war bonds and the profitability of investments in these bonds from investors' perspectives. Research has shown that parties to a conflict at the beginning of warfare can obtain cheap financing. As the conflict develops, bond yields increase but only to a certain level. Once a certain threshold is exceeded, there is no increase in the yield. The phenomenon was explained by the clientele effect, i.e., the differentiation of groups that purchase financial instruments. The first issuances of war bonds are mainly covered by investors seeking profit and the so-called "patriotic demand". As the conflict develops, the risk increases, and only patriotic demand persists. The second regularity observed is that it is unprofitable to invest in war bonds. It appears inefficient since war bonds are below the CAPM line. The inefficiency results from patriotic demand, namely when bonds are purchased by citizens whose desire for profit is of secondary importance. The analysis also shows that countries, where no warfare is taking place are more likely to discharge their obligations. That is logical, as economies of not destroyed countries are more likely to repay their liabilities. However, it indicates that the war bond market is not efficient. Investors should consider their expectations and request higher bond yields, which has not happened so far. Another regularity noted is that, at the beginning of the conflict, bonds do not signal which side to the conflict has a better chance of winning.

KEYWORDS

war bonds, investment, investment efficiency

* Corresponding author



© 2022 by Author(s). This is an open access article under the Creative Commons Attribution International License (CC BY). <http://creativecommons.org/licenses/by/4.0/>

Introduction

When facing the threat of war, one of the critical decisions the authorities are obliged to take concerns war finance. There are many methods of financing war; the most common ones include taxation and debt. Obtaining debt can be done by issuing war bonds, including those for individual investors.

These bonds are financial instruments, and like other financial instruments they can be subject to financial analysis. The effective markets hypothesis [1] assumes that investors demand

higher rates of return for higher investment risk. In other words, the higher the investment risk, the higher the expected rate of return. If this dependence is distorted, we can speak of an informationally inefficient market.

The financial markets were not developed during the First World War. Volunteer groups were going door-to-door to sell war bonds. The investment was often treated as a volunteer action. War bonds were also sold to children and the elderly, who often invested their life savings in them. Given the above, it can be expected that the war bond market is inefficient. Therefore, the main research hypothesis assumes that the war bond market is not information-efficient.

Strategies of informationally inefficient markets allow achieving above-average rates of return. For that reason, if the existing rules provide for higher investment results at a given risk level than the market average, one can speak of an inefficient market. The auxiliary hypotheses sound as follows:

1. A strategy of waiting for the conflict to develop and investing in a later phase of warfare is worthwhile.
2. It is more profitable to invest in the war bonds of countries that do not participate directly in armed conflicts than in those of countries where the fighting is ongoing.
3. The profitability of bonds indicates which side to the conflict is more likely to win.

The first part of the work presents the most significant outcomes of research on war bonds. Then, the methodology of research applied in work is described. In the next part, the results of calculations and their analysis are presented. The conclusion discusses the results achieved and presents possible directions for further research.

1. Research review

Financing war with bonds has several advantages over financing it with taxes. High taxation imposed increases the aversion to war [2, p. 88]. Civilians are aware of the cost of war, and their reluctance to war aggravates over time [3]; thereby, war taxes have a demotivating effect on the population [4]. However, issued war bonds cause civilians to not immediately feel the cost of armed conflicts [5]. That allows postponing some negative financial consequences over time [6].

The issuance of war bonds has an incentive effect on the population. Apart from emotional involvement in the outcome of the war, there is also a financial factor. The investors expect a favorable resolution of the armed conflict as they can earn money from it. Losing a war enhances a risk that bonds will not be repaid [7].

In times of armed conflict, the risk increases, as does the rate of return expected by investors. When the market does not offer reasonable return rates at a given risk level, investors decide not to invest, contributing to a decrease in economic activity. Raising taxes in times of armed conflict means that as the risk increases, the expected rate of return the investors may achieve decreases. That adversely impacts the profit-risk ratio and economic activity [8, p. 66].

Yago and Trimbath [9, p. 6] state that not only do military bonds serve to finance the war, but they are also crucial for the industrial development of the country and the affected region. Carter [10, p. 3-13] notes that higher interest rates on bonds do not necessarily translate positively into greater demand for war bonds and may reduce economic growth. War bonds have still been issued; for example, after the attacks of 11 September 2001, the US government launched a series of EE bonds [11].

There are not many studies in the world literature that analyze the information effectiveness of war bonds from investors' point of view. Therefore, the study can at least partly contribute to filling the research gap.

2. Methodology

In times of armed conflict, the risk increases and, consequently, the working methodology is to collect data and analyze the yield of war bonds. The bonds issued by national governments during the First and Second World Wars were adopted as a research group. In the beginning, bonds were sold to the population, and as the conflict developed, banks and private companies were forced to buy these securities. For that reason, to achieve real bond yields, the research group was restricted to bonds issued mostly to voluntary purchase.

The countries that decided to issue war bonds did so in stages as the conflicts developed. That made it possible to examine how the yields of new bond issues have changed over time.

The bond yield at the time of purchase is calculated from the formula:

$$YTM = \frac{C + \frac{M-P}{N}}{\frac{M+P}{2}} \quad (1)$$

where:

YTM – rate of return on the maturity date (Yield to Maturity),

C – bond coupon,

M – nominal value of bonds,

N – number of years to maturity of bonds,

P – purchase price of bonds.

3. The yield on the war bond maturity date

Table 1 summarizes war bonds issued mainly by countries participating in the First and Second World Wars.

War bonds on a massive scale only appeared during the First World War. The first bonds of Austria-Hungary were issued in 1914. They were characterized by a relatively low required rate of return of 5%. The federal states issued further bonds. Both Austria and Hungary raised capital for conducting the war with an interest rate of 5.5%. When it was clear that the war would not end quickly, the yield on the bonds increased to 6.25% and remained at this level until the end of the conflict.

When France joined the war, it obtained financing at 5%, close to the German level. As the war was prolonged, the bond yields increased, and in the following years, they fluctuated around 5.7%. In the last year of the armed conflict, bond yields fell, suggesting that investors were expecting an imminent victory for France.

Before World War I, Canada did not have an economy as prosperous as the European countries. The relatively young country obtained an interest rate of 5% in the first war financing. Therefore, it was close to the bond yields of the countries that were at war. As the conflict continued, interest rates rose to 5.5% and remained at this level until the end of the war.

The British Empire was a superpower before the First World War, and thereby, it was able to get a low 3.5% financing in relation to other countries in conflict. As the conflict continued, investors required higher returns, which rose to 5% at the end of the war.

Table 1. Selected war bonds issued during World War I and World War II

Country	Year of issue	Yield on the maturity date	Bond repaid?
Austro-Hungary	1914	5.00%	outstanding
Austria	1914	5.50%	outstanding, inflation
Austria	1915	6.25%	outstanding, inflation
Austria	1916	6.25%	outstanding, inflation
Austria	1917	6.25%	outstanding, inflation
Austria	1918	6.25%	outstanding, inflation
Hungary	1914	5.50%	outstanding, inflation
Hungary	1915	6.25%	outstanding, inflation
Hungary	1916	6.25%	outstanding, inflation
Hungary	1917	6.25%	outstanding, inflation
Hungary	1918	6.25%	outstanding, inflation
France	1914	5.00%	inflation –80%
France	1915	5.73%	inflation –80%
France	1916	5.71%	inflation –80%
France	1917	5.83%	inflation –80%
France	1918	5.65%	inflation –80%
Canada	1915	5.00%	repaid
Canada	1916	5.00%	repaid
Canada	1917	5.50%	repaid
Canada	1918	5.50%	repaid
Canada	1919	5.50%	repaid
German	1914	5.00%	inflation
Great Britain	1914	3.50%	repaid
Great Britain	1915	4.50%	repaid
Great Britain	1916	5.00%	repaid
Great Britain	1917	5.00%	repaid
the USA	1916	3.50%	repaid
the USA	1917	4.00%	repaid
the USA	1918	4.25%	repaid
the USA	1919	4.25%	outstanding –41%
Canada	1940	3.00%	repaid
Canada	1941	3.00%	repaid

Country	Year of issue	Yield on the maturity date	Bond repaid?
Canada	1942	3.00%	repaid
Canada	1943	3.00%	repaid
Canada	1944	3.00%	repaid
Canada	1945	3.00%	repaid
the USA	1942	2.92%	repaid
the USA	1943	2.92%	repaid
the USA	1944	2.92%	repaid
the USA	1945	2.92%	repaid

Source: Own study.

The United States, then emerging economic power, entered the conflict at the end of the war. It obtained financing at 3.5%. That was as much as the British Empire at the beginning of the war. As the conflict developed, bond yields rose to 4.25%. It is worth noting that the United States could obtain low interest rates on the bonds because it as was virtually indebted.

Thus, one can see a clear pattern: with the conflict development, bond yields rise but to a certain level, beyond which they remain stable. That may indicate two sources of demand for war bonds: investment and patriotic ones. As the conflict developed, the profit-seeking investors withdrew from such investment, and in their demand for bonds, they were replaced by people that wanted to buy ones without necessarily making a profit. The second reason for the stoppage in bond yield growth was forcing banks and companies in some countries to purchase war bonds. The factor has been partially eliminated from the research while only considering the series of bonds mostly covered by individual investors.

Out of the seven countries involved in the conflict, only three countries could repay the incurred liabilities. That indicates a low return on the investment of these bonds. Canada and the United Kingdom have kept their commitments and either repaid or have been paying them back until now. The United States has repaid all financial obligations during World War I, except for the last bond issue. The last bond issue was guaranteed in gold. However, the gold-dollar parity was meanwhile abolished, which reduced the investment in gold by 41%. Austria and Hungary failed to pay their liabilities after Austria-Hungary had collapsed, and hyperinflation made the investment value close to zero. The situation was similar in Germany. Investors holding French war bonds received a return, but high inflation caused the value of investments (expressed in real terms) to fall by 80%.

The data analysis proves that it is more profitable to invest in war bonds of countries where warfare is not taking place (Canada, the USA). On the one hand, it seems only seemingly logical. Investors should take this into account in their investment expectations; thus, a situation where some instruments are known in advance as better and others as worse should not happen. For additional risk, investors should demand a higher rate of return (which was not the case) or additional collateral (e.g., pledge on assets in neutral countries).

It cannot be clearly stated from the collected data whether the bonds indicate which party has a better chance of winning when the conflict begins. At the beginning of World War I, bonds of Germany, Austria-Hungary, and France had similar yields; hence the conflict must

have been evenly distributed. Indeed, none of the parties to the conflict had, for many years, gained an advantage to defeat their opponent. During the Second World War, it was only possible for the countries that had paid off World War I bonds to finance their military operations. Therefore, it can be concluded that the capital markets are learning and becoming more and more informationally effective.

The existence of strategies that allow above-average rates of return to be achieved on investments in war bonds makes it possible to adopt the main hypothesis that the war bond market is informationally inefficient.

Conclusion

Due to the relatively low development of the capital market at the beginning of the 20th century and the insignificant number of publications covering financing war with war bonds, the research has been limited to World War I and World War II bonds.

Research has shown that parties to a conflict at the beginning of warfare can obtain cheap financing. As the conflict develops, bond yields increase but only to a certain level. Once a certain threshold is exceeded, there is no increase in the yield. The phenomenon was explained by the clientele effect, i.e., the differentiation of groups that purchase financial instruments. The first issuances of war bonds are mainly covered by investors seeking profit and the so-called "patriotic demand". As the conflict develops, the risk increases, and only patriotic demand persists.

The second regularity observed is that it is unprofitable to invest in war bonds. It appears inefficient since war bonds are below the CAPM line. The inefficiency results from patriotic demand, namely when bonds are purchased by citizens whose desire for profit is of secondary importance. Moreover, the bonds of war were aimed at people who had no experience of investing and hence were more susceptible to the promised rates of return and did not realize the investment risk.

The analysis also shows that countries, where no warfare is taking place are more likely to discharge their obligations. That is logical, as economies of not destroyed countries are more likely to repay their liabilities. However, it indicates that the war bond market is not efficient. Investors should consider their expectations and request higher bond yields, which has not happened so far.

Another regularity noted is that, at the beginning of the conflict, bonds do not signal which side to the conflict has a better chance of winning. That does not necessarily mean inefficiency. The First World War was very fierce and it was impossible to know in advance which side had a better chance of winning.

It can be said that the war bond market is very inefficient. That stems from patriotic demand, low investor awareness, and the initial phase of market development.

Further research should focus on analyzing the events during the First and Second World Wars that affected profitability. That may help to clarify whether individual events may shape changes in bond yields. The research can be repeated on a larger research group. Subsequent studies should also take account of war bonds taken up by companies and not just individual investors.

Acknowledgement

No acknowledgement and potential founding was reported by the authors.

Conflict of interests

All authors declared no conflict of interests.


Author contributions

All authors contributed to the interpretation of results and writing of the paper. All authors read and approved the final manuscript.

Ethical statement

The research complies with all national and international ethical requirements.

ORCID

Włodzimirz Szkutnik  <https://orcid.org/0000-0002-4634-3397>

Tomasz Wyluda  <https://orcid.org/0000-0002-1524-8493>

References

1. Fama EF. *Efficient Capital Markets: A Review of Theory and Empirical Work*. The Journal of Finance. 1970;20.
2. Heller W. *New Dimensions of Political Economy*. Cambridge: Harvard University Press; 1966.
3. Gibbons WC. *The U.S. Government and the Vietnam War: Executive and Legislative Roles and Relationships (Vol. Part IV: July 1965-January 1968)*. Princeton: Princeton University Press; 1995.
4. Levi M. *Of Rule and Revenue*. Berkeley: University of California Press; 1988.
5. Flores-Macias GA, Kreps SE. *Borrowing support for war: The effect of war finance on public attitudes toward conflict*. Journal of Conflict Resolution. 2017;61(5):997-1020.
6. Mastanduno M, Lake DA, Ikenberry GJ. *Toward a Realist Theory of State Action*. International Studies Quarterly. 1989;33:457-74.
7. Fujihira S. *Conscripting Money: Total War and Fiscal Revolution in the Twentieth Century*. [Unpublished Dissertation]. Princeton, NJ: Princeton University; 2000.
8. Cappella R. *The Political Economy of War Finance*. Publicly Accessible Penn Dissertations. 1175. 2012, [online]. Available at: <http://repository.upenn.edu/edissertations/1175> [Accessed: 12 June 2019].
9. Yago G, Trimbath S. *Beyond Junk Bonds: Expanding High Yield Markets*. New York, Oxford: Oxford University Press; 2003.
10. Carter SB, Gartner SS, Haines MR, Olmstead AL, et al. *Historical statistics of the United States: millennial edition*. Cambridge [England], New York: Cambridge University Press; 2006.
11. Makinen G. *The economic effects of 9/11: A retrospective assessment*. [Washington, D.C.]: Congressional Research Service [Library of Congress]; 2002.

Biographical note

Włodzimirz Szkutnik – Ph.D. (hab.), graduated in mathematics from the Silesian University in Katowice in 1974. Doctor of Economic Sciences (1982), post-doctoral degree in economic sciences (1993), Professor of economic sciences (2004). In his scientific work he has dealt with stochastic programming, statistics, and insurance risk.

Tomasz Wyluda – graduated in economics in 2010 from the University of Łódź. He holds certificates and licenses in finance: Investment Advisor, CFA, PRM, CAIA. His scientific interests

focus on the issues of informational efficiency of markets and investments on the stock and bond markets.

Efektywność inwestowania w obligacje wojenne

STRESZCZENIE

Jedną z kluczowych decyzji, jakie władze muszą podjąć w obliczu zagrożenia wojną, jest decyzja o finansowaniu działań wojennych. Najpowszechniejszymi metodami są podatki oraz zadłużenie. Praca koncentruje się na finansowaniu działań wojennych obligacjami wojennymi i opłacalnością inwestycji w te obligacje z punktu widzenia inwestorów. Badania wykazały, że strony konfliktu na początku działań wojennych mogą tanio pozyskać finansowanie. W miarę rozwoju konfliktu, rentowność obligacji rośnie, ale do pewnego poziomu. Po przekroczeniu pewnego progu nie zauważono wzrostu rentowności. Zjawisko to wytłumaczono efektem klienteli, czyli zróżnicowania grup, które nabywają instrumenty finansowe. Pierwsze emisje obligacji wojennych obejmowane są głównie przez inwestorów szukających zysku oraz tzw. „popyt patriotyczny”. W miarę rozwoju konfliktu rośnie ryzyko i utrzymuje się jedynie popyt patriotyczny. Drugą zaobserwowaną prawidłowością jest fakt, że nieopłacalne jest inwestowanie w obligacje wojenne. Obligacje wojenne znajdują się poniżej linii CAPM, co jest nieefektywnością. Nieefektywność ta wynika z popytu patriotycznego, czyli z nabywania obligacji przez obywateli, dla których chęć zysku ma drugorzędne znaczenie. Z analizy wynika także, że kraje, na terenie których nie toczą się działania wojenne, mają większą szansę na spłacenie zobowiązań. Jest to logiczne, ponieważ gospodarki krajów, które nie są zniszczone, mają większą możliwość spłaty zobowiązań. Sygnalizuje to jednak, że rynek obligacji wojennych nie jest efektywny. Inwestorzy powinni uwzględnić taką sytuację w swoich oczekiwaniach i żądać wyższej rentowności obligacji, co jednak nie miało miejsca. Kolejną prawidłowością jaką zauważono, jest fakt, że obligacje nie sygnalizują na początku konfliktu, która strona konfliktu ma większe szanse na wygraną.

SŁOWA KLUCZOWE obligacje wojenne, inwestycje, efektywność inwestowania

How to cite this paper

Szkutnik W, Wyłuda T. *Effectiveness of investing in war bonds*. Scientific Journal of the Military University of Land Forces. 2022;54;2(204):214-21. DOI: 10.5604/01.3001.0015.8974.



This work is licensed under the Creative Commons Attribution International License (CC BY).
<http://creativecommons.org/licenses/by/4.0/>