

Securitization as an innovative refinancing mechanism and an effective asset management tool in a sustainable development environment

Sergiy Legenchuk¹, Maryna Pashkevych², Olga Usatenko², Olha Driha², and Valentyna Ivanenko^{1,}*

¹Zhytomyr Polytechnic State University, Department of Accounting and Auditing, Zhytomyr, 10005, Ukraine

²National Technical University "Dnipro Polytechnic", Department of Accounting and Auditing, Dnipro, 49000, Ukraine

Abstract. Today's realities dictate to Ukrainian companies a management philosophy that requires them not only to maintain their position in the market, but also to increase the efficiency of their operations and development in the context of favorable and unfavorable changes in the market environment, which necessitates significant amounts of financial resources. In the face of global competition and the increased turbulence of the external environment, securitization is one of the alternative tools to attract additional financing as well as to minimize risks by which financial markets can support sustainable finance in the transition to a green economy. The article deals with the essence of securitization as one of the major financial innovations of our time. It is established that this financial mechanism allows to diversify sources of financing, to effectively manage the structure of the balance sheet of the enterprise, as well as to significantly increase the level of liquidity of its assets. It also describes the main types of securitization and their impact on the structure of balance sheet indicators. The practical relevance of the study is that the authors' highlighted areas of change in financial performance make it possible to make a smart decision on the use of a particular securitization mechanism, considering the purpose of its implementation and the capabilities of its initiators, including in the transition to a green economy. It is suggested for the successful implementation of the concept of a "green" economy aimed at achieving sustainable development goals in Ukraine, using such financial instrument as sustainable securitization through the use of the collateralized loan obligation mechanism.

1 Introduction

Uncertainty of business environment, constant competition, inflation growth rate, and deficit of available financial and investment resources under the conditions of the lack of own money stimulate economic entities (it concerns both financial sector and real sector) to search for new tools to rise extra financing. In this context, securitization as an innovative mechanism of the structured financing on favourable terms making it possible to attract finance while issuing and offering of asset-backed securities becomes extremely important.

In the context of the developed countries, securitization is generally recognized as the tool of advantageous funds raising; moreover, it is an integral part of a financial market. Securitization mechanism originated in the USA early the 1970th when, on the one hand, banks needed cushioning of risks, and on the other hand, population demonstrated increased demand for mortgage credits. Thus, the mechanism became a financial banking revolution.

First, it was implemented in the form of mortgage relations between banks and other business entities. However, from the mid 1980th, securitization contacts started to involve gradually different types of assets:

autoloans; consumer credits; credit card payments; export deliveries; trade financing; factoring transactions; insurance payments; leasing payments; utility payments; municipal loans of states secured by budget receipts etc. In the second half of the 1980th, issue of asset-backed securities started in the majority of the developed countries including the United Kingdom, Germany, Italy, Spain, the Netherlands, France, Australia etc. However, Eastern Europe, and Central Europe "got to know" the mechanism in 20th century only. First of all, a degree of securitization relations in one or another country depends upon the legal system of the nation, development of its financial markets, currency limitations, tax laws, accounting rules, the current system of its governmental regulation, and transparency of economy.

In the context of the countries where securitization experiences its dynamic progress during the last decades, providing its participants with efficient tool of diversification of sourcing as well as risks of investment in different assets, new types of financial tools originated and access of new participants the market was afforded which favoured expansion of the world capital market and its extension while animating progress of the global financial industry.

In recent years, there have been a major structural

* Corresponding author: ivanenko2112@gmail.com

transformation of the global securitization market, characterized by significant development of its such type as sustainable securitization, aimed at achieving sustainable development goals. This is due to what C. McGarry, D. Dey, and M. Hauman have noted, that the sustainable finance market has experienced exponential growth in certain product areas in the last 5 years. Annual green bond issuance, for example, passed the US \$ 100bn mark last year and environmental resilience is playing an increasingly important role in investment decisions worldwide. However, US \$ 90tn more in sustainable investment is needed to develop global sustainable infrastructure alone in the next 15 years [1]. Therefore, in order to enable institutional investors to invest in sustainable assets, the functioning of which is aimed at ensuring sustainable development (renewable energy, environmental innovations, circular economy projects,

“green” buildings, sustainable agriculture, etc.), active implementation of sustainable securitization tools is necessary.

2 Assessment of securitization market

The total volume of the global securitization market at the end of 2013 amounted to more than 600 billion US dollars, and in 2018 reached almost 850 billion US dollars. Moreover, such issues in the world are half provided with a mortgage, one-third are loans for infrastructure projects and the real sector, and other issues are provided with distressed and other assets [2].

Generally, securitization development is not uniform both in terms of regions and in terms of the world countries (Fig. 1).

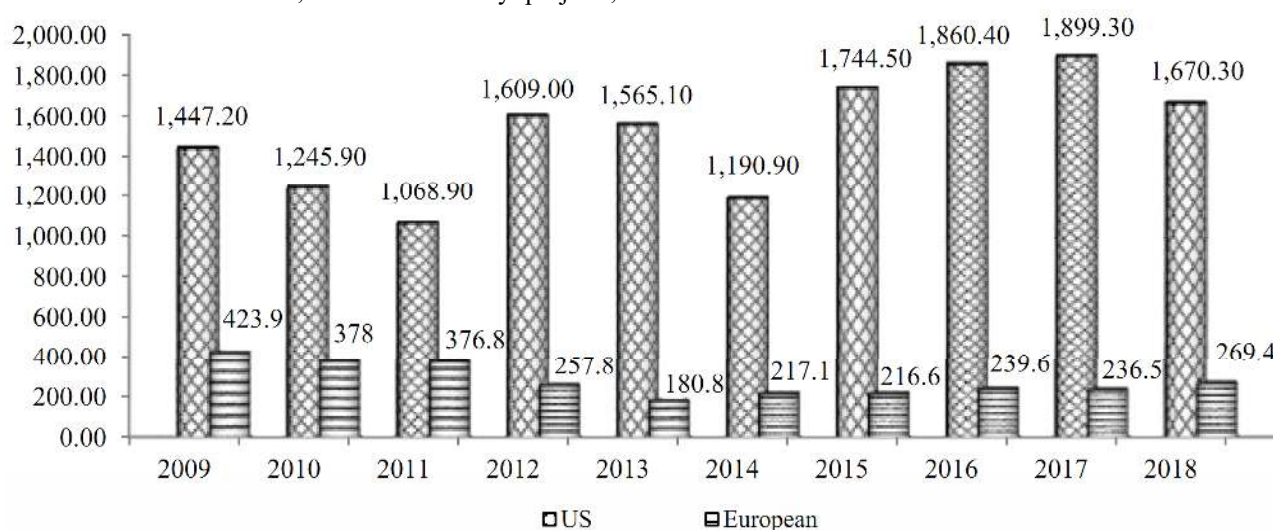


Fig. 1. European and US Securitization Issuance, € Billions (based on the reports on the securitization of ASIFMA [3], AFME [4] and SIFMA [5]).

The securitization market in the US represents 60% of the global market today. The crisis impacted heavily the volumes of US securitization which fell from over EUR 2,0 trillion in 2007 to EUR 915,8 billion in 2008 (inclusive of ABS, CDOs, Agency MBS and Non-Agency CMBS/RMBS) and have since recovered fully to EUR 1,9 trillion for all of 2017. All the asset classes (but private label MBS – which is nevertheless off its lows) showed an impressive rebound [6].

The securitization market in Europe was rather undeveloped till the late 1990th. Since then, there has been a significant increase in securitization activity. Many of the securitization products widely used by the financial industry across the world have been developed in the UK. The UK securitization is the largest market in Europe. The financial crisis in Europe made securitization plunge from EUR 819 billion in 2008 to EUR 423 billion in 2009 and steadily decreased to EUR 180 billion in 2013, before finally recovering at EUR 237 billion in 2017. It is interesting to highlight that European securitizations have held up very well through and since the crisis in both credit and pricing terms. European policymakers are making every effort to revive the market, since the rationale for securitization and the benefits it provides

remain strong [6].

Europe saw a general spread compression which pushed investors to look for yield and hence supported deals with better pricing such as peripheral paper, CLOs, CMBS & non-prime RMBS. In Europe, there are mainly three types of investors interested in securitization: a) institutions without deep multiple funding sources (e.g. challenger/smaller banks, non-bank FI's and PE houses off the back of acquisitions) or that have a strategic reason to securitise (i.e. showing liquidity for an IPO or deleveraging), b) peripheral jurisdictions, c) arbitrage players (e.g. CLO managers or bank underwritten CMBS), and d) the auto sector where spreads are very tight [7].

Europe's "Capital Markets Union" (CMU) is rapidly gaining traction. Announced in November 2014, the new European Commission (EC) under Jean-Claude Juncker quickly capitalized on the more buoyant post-crisis mood among the member states of the European Union (EU). In that context it kick-started a series of "public" consultations on what it deemed to be the key priorities of the set of proposals included in the original Green Paper [7].

In response to the increasing regulatory and policy

focus on Sustainable Finance (including the environmental aspects) in September 2019 AFME has published a position paper on Green Securitization in which we highlighted the key voluntary principles which policymakers and market participants should support to help propose green securitization. Among those principles, defining green securitization simply and clearly, as well as regulatory support and proportionate (non-duplicative) disclosures have been indicated as one of the most important factors [8].

In Asia, the regulatory and market frameworks governing securitization are relatively nascent. Domestic securitization markets are more active relative to their cross-border counterparts. Crossborder issuance, which is only a fraction of US and European issuance, dropped sharply post 2008 as the market for CDOs (which accounted for the bulk of Asian issuance pre-2008) virtually shut down. It is worth noting that, as long as Asian companies will be able to obtain cheap funding in their local capital markets, they will not look to cross-border securitization deals [6].

Changes in the market of securitized assets are determined by various factors, including the economic situation in regions, countries and individual sectors of the economy; conjuncture in the financial markets; fiscal policy; regulatory and supervisory requirements; the methodology of rating agencies regarding the valuation of assets under consideration. An analysis of the data presented allows us to talk about stabilization trends in the global markets for securitized products. As foreign experience has shown, the impact of securitization on financial systems in different countries may be different due to the dissimilar structure of these systems or differences in the way monetary policy is implemented.

All in all, the last decades expanded significantly the circle of assets used during securitization. In addition to mortgages, other loan types (i.e. consumer credits, auto loans, business credits, credit card payments etc.) started to be applied. What is more, lease assets; money claims under the license agreements and franchise agreements; future insurance premia; proceeds of oil importers; and transfers for broadcasting are used as the assets. Furthermore, export earnings, oil and gas rights, payments for transportation services (i.e. air and railway tickets), telephone bills; utility payments; lottery gains; and entertainment revenue are the assets involved in securitization (Table 1).

Currently, large power companies, broadcasting companies, gas companies, coal companies, and oil companies (i.e. so-called capital intensive-companies which cannot go without loan money and for which introduction of such a scheme would cut assets critically) are the potential imitators of securitization. Mechanism of securitization is a real thing to finance infrastructural projects and to develop financial leasing, insurance market, modern wholesale and retail trade networks, export-import relations etc.

Copyright application is a case of point of flexibility of investors as well as other financial market participants as for the basis assets in the securitization process. Actually, issue of Bowie bonds in 1997 to the amount of 55 million USD based on the royalty paid for British artist

for the use of more than three hundred music composition has become the first example [9].

Table 1. Objects of securitization depending upon its initiator.

Securitization initiator	The assets to be securitized
Banks	Mortgages; commercial credits; consumer finance; autoloans; student loans; credit card debts; lease payments; and factoring payments
Lease companies	Payments by lease agreements
Factoring companies	Factoring payments
Insurance companies	Insurance premia
Corporations	Export earnings (future accrual from economic activities (inclusive of trade); money claims against license agreements; and against franchising agreements
Broadcasting companies	Future proceeds from broadcasting; and rents from the equipment used
Mobile communication companies	Future proceeds from subscribers
Oil and gas companies	Future proceeds from oil importers; and rights for oil extraction and gas recovery
Public utilities	Community charges; and future proceeds from electricity, water, and heating
Transportation companies	Future proceeds from air and railway tickets
Entertainment companies	Future earnings in the sphere of film and sports industries; and proceeds from future sales of the recorded music
Bodies of public authorities and local authorities	Tax revenue; and another regular budget revenue

However, one of the most urgent areas of investment in the face of exacerbated social problems, scarcity of resources, environmental and climate risks at the current stage of society development is sustainable assets used in the securitization process. This is due to the fact that in the context of the active introduction of the concept of sustainable development in the world into companies' activities, thanks to the support in 2015 of 17 UN Sustainable Development Goals in all 193 countries, the market of investments in sustainable assets is growing exponentially and this trend will continue in the next decade. For example, according to OECD representatives' calculations, there will be a steady increase in investment needs for sustainable assets (Table 2).

Table 2. Annual investments needs for renewable energy, energy efficiency in buildings and low-emission vehicles in a 2DS compared to global energy sector needs, 2015-2035 [10].

Indicators	2015 – 2020	2021 – 2025	2026 – 2030	2031 – 2035
Renewable energy, energy efficiency and low-emission vehicles investment needs in the four markets (China, EU, Japan and United States), billion	573	1315	1264	2262
All global investment needs for energy supply and energy efficiency, billion	839	2230	2404	4340
Share, %	68	59	53	52

3 Eclecticism of fundamental notions of assets securitization

In his paper, titled as “The Alchemy of Asset Securitization”, Steven L. Schwarcz [11] describes securitization as alchemy of the current financial market which can transform lead to gold, i.e. a right of money claim to securities. Moreover, he focuses attention on the fact that securitization is as profitable as it can form capital right at the expense of securities market where capital value is relatively lower.

“Life after life” is the definition by A. O. Soldatova characterizing a destiny of asset rebirth at a capital market after their securitization [12].

The term “Securitization” originated from “Bank of America issue” agreement. It was first proposed in 1977 by Lewis S. Ranieri, who headed a Mortgage-Trading Desk of Salomon Brothers, to Ann Monroe, a reporter of Wall Street Journal, to help her describe underwriting of the issue of securities by Bank of America backed by a pledge of receivables in terms of mortgages. The operation relies on a pass-through structure when a special purpose vehicle (SPV) distributed all the funds, “generated” by credit pool at the time of payments for such financial credit documents, among security holders [13].

Despite the fact that the concept originated at the turn of the 1970s, scholars do not have any identity of views concerning the idea of asset securitization. Like that, such Western researchers as R. Berry and J. France [14] supposed there were almost 279 definitions of securitization in the early 1990th only in London.

In this connection, Hans Peter Bär, famous Swiss securitization scholar, believes it is required to bear in mind a number of factors while considering all the available definitions. First, attention should be focused on the fact that some of them emphasize either certain elements (for instance, asset pool sale; use of the pool to back the securities) or a fact of risk separation and transfer. Second, there are numerous efforts to make a definition which would involve all possible variants inclusive of asset-backed transactions, project financing or even crediting followed by a backing of assignment of receivables. Moreover, rather often the terms “asset securitization” is applied improperly. Most probably, the annoying misunderstanding can be explained by the fact that asset securitization is not a well-defined operation; depending upon certain jurisdiction and customer needs it is based upon individual approaches taking into consideration a specific situation, i.e. it is a tailor made financial solution [15].

It should be noted that in his monograph titled as “Asset securitization: securitization of assets – innovative technique of bank financing”, which became the classic securitization manual for Swiss, German, and Austrian bankers, H. P. Bär differentiates the two concepts: “securitization” (i.e. securitization in a general sense), and “asset securitization” (i.e. securitization in a narrow sense):

- in a general sense, securitization is understood as a shift of international financing from a credit market to a money

market, and to capital markets; replacement of credit financing by schemes based upon the issue of securities; and disintermediation;

- in a narrow sense, asset securitization is: innovative financing technique; specific form in terms of general tendency for securitization. Its basic idea is to write down financial assets from an enterprise balance and to refinance them by means of security issue at the international market and at a capital market. Mortgage-Backed Securities (MBS) and Asset-Backed Securities (ABS) are the key tools [15].

Etymologically, the word “securitization” comes from the English “securities”. Economic meaning of securitization relations is understood as a movement of money (inclusive of its attraction) with the help of securities rather than traditional bank credits. Having formed asset pools, market participants as the subjects of securitization relations, issue securities for their backing and convert them at a capital market. Hence, while raising the finances, the market participant can direct them to implement new relations inclusive of extra profit taking in the form of a difference between asset interest and security interest which is favourable for turnover of funds [16].

To support the abovementioned, J. Tavakoli [17] defines securitization as a market economy conception which forecasts a subset of tools of the structured financing. In substance, it is the creation of securities backed by asset pool (portfolio) and their issue; as a rule, the asset debtors vary. Actually, any combination of financial assets or cash flows may be converted into market securities to sell them to investors, i.e. securitized.

The analysis of recent studies and publications concerning the idea of asset securitization, helped identify the basic concepts of the process mentioned in the definitions of scholars:

- financing (refinancing) method (type);
- issue of securities backed by a pool of homogenous assets;
- process (method) to transform (convert, repack) low liquid assets in liquid ones (i.e. securities);
- process (mechanism) involving a number of successive stages (steps); generally, obligatory stages are: formation of the diversified pool of homogenous financial assets; its writing-down from the securitization initiator balance by means of their transfer to a specially established company; issue of securities, backed by the assets, by the company, and their placing among the investor community;
- method of risk hedging;
- process to increase the role of the securities to compare with bank crediting.

We believe that on the whole, securitization is one of the financing types relying upon the use of tools of security market. Thus, asset securitization is a narrower conception; it characterizes a process of issuing and servicing of securities backed by a flow of payments generated with the help of the separated pool of homogenous assets. In this context, the asset pool is understood as a collection of rights of a money claim.

4 Securitization mechanism

In general, asset securitization mechanism forecasts that its initiator, being an originating company (i.e. banks or other financial institutions; nonfinancial corporations; governmental authorities; public utilities etc.) generates assets in the process of its operational activities (for instance, while disbursing loans; delivering goods; providing services inclusive of demising etc.). As a result, the company becomes the owner of assets, i.e. claims for the third parties (debtors). Further, the claims form asset pool. To back them up, securities are issued with their following monetization at a stock market. Payment flow and credit backing characteristics identify quality of the issued securities while specifying both monetization and structurization of the asset securitization.

While raising money in such a way, the economic agent is permitted to use it for the implementation of new relations inclusive of making extra profits in the form of difference between the asset interests and security interests which favours the money negotiability.

It is obvious that the asset securitization process involves a number of economic mechanisms covering rather broad spectrum of participants and specific agreements developing certain complex which in turn can vary significantly and be supplemented depending upon the object and possibilities of securitization initiators. Hence, A. A. Kazakov considers that even shallow analysis of security issue prospectus in terms of the securitization has shown that the current agreements are participated by almost fifteen counterparties among whom more than a dozen of various contracts are effected [13]. Asset-backed debtors (i.e. direct debtors); initiator being the asset owner as well initiator of the securitization process itself; Special Purpose Vehicle issuing securities in terms of the classic securitization; investors discounting the news; hedge providers hedging both currency risks and interest risks; rating agencies evaluating reliability of the issued securities and expressing their independent opinion concerning credit quality; insurance companies acting as guarantors and running the risks connected with the securitization process; legal companies engaged in contractual process; accounting and auditing companies, and many other participants. Such a great number of professional participants make it possible to carry out unique operations since they fulfill their functions more effectively and less costly to compare with other people.

Relying upon the abovementioned and following the source materials interpreted by us [11, 12, 15, 18-24, 27], we have identified that following obligatory features are typical for asset securitization:

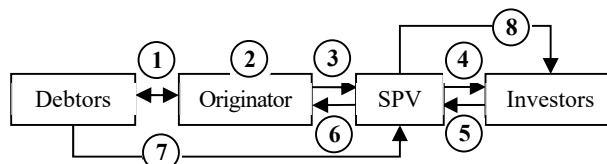
- The assets to be securitized should generate such money flow which can be measured and forecasted;
- The formed asset pool should be able to be separated (either mechanically or juristically) from other assets of the company;
- Debt securities, issued during securitization, should be backed by a pool of homogenous assets;
- Purposely established company of personally initiator of the securitization may be issuers of the debt securities;

- Initial assets, underlying the agreement, back up the assets within the securitization system, i.e. money flows through the securitized assets should be the source of interest payment as well as the principal on the issued securities;

- Risk management as for the separated asset pools is performed by means of their complete transfer to the investors or their partial transfer.

It is understood that asset securitization is rather complex and multiaspect mechanism; therefore, securitization agreements differ greatly. However, the current world practices identify its two basic models depending upon the securitized asset location, purposes of the initiator, and securitization procedure. They are: off-balance-sheet model and a balance-sheet one. Mainly, they differ in the fact whether the assets are liquidated or not.

Classic (i.e. traditional) off-balance-sheet securitization is based upon a “true sale” scheme characterized by transfer of asset pool to be securitized to a specially established mediator, i.e. Special Purpose Vehicle (SPV). In turn, such a financial mediator put up money for the purchase of the assets by means of issue of securities backed by future cash flows from the assets and provides their distribution among investors at the capital market. Following payments of debts and interest by owners of the issued securities are carried out at the expense of funds provided from debt recovery by borrowers where claims are transferred from initiator to SPV (Fig. 2).



- 1) origination of a monetary claim rights (origination of debtors); 2) formation of homogenous asset pool; 3) sale of asset pool to SPV (“true sale”); 4) issue of securities backed by the purchased asset pool; 5) payments for the purchased securities by investors; 6) cancellation of the purchased asset pool; 7) payments of interest and the principal by debtors according to the effected agreements; 8) security debt repayment to the investors

Fig. 2. Model of the off-balance-sheet (classical) asset securitization.

The initiator bankruptcy cannot stop credit portfolio servicing; if default of the portfolio share takes place then junior tranche assumes the first risks.

The basic investor risks, resulting from asset securitization, depend directly upon SPV activities. In this context, investors are not interested in the constant control over SPV operations. That is why, international practices have gradually developed specific requirements for SPV legal status providing adequate protection of rights and interests of investors, and management of their risks connected with the purchase of asset-backed securities. Among other things, following requirements favour minimization of SPV bankruptcy risks:

- SPV independence from the initiator (SPV is established separately, being free of the initiator economically and

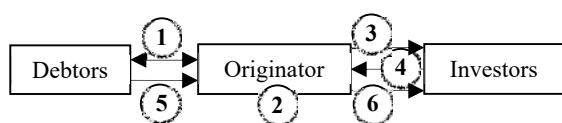
legally to prevent its joining the consolidated group of a primary owner of asset pool and to avoid potential after-effects of insolvency);

- SPV bankruptcy protection (SPV development should involve impossibility of its voluntary bankruptcy and liquidation as well as merger with another enterprise or other reorganization forms);
- SPV limitations as for the carrying out of various activities, i.e. special franchise (primary objective of SPV is to purchase asset pool from the initiator, and issue of securities backed by the asset pool. Hence, organizational structure of SPV should be limited by strictly determined activity types and it cannot involve any other employees in addition to those needed directly to implement securitization agreements).

Thus, the traditional scheme prevails in the legal determination of the securitized assets of the initiator and, consequently, in the related risks which makes it possible (to compare with the agreement initiator ranking) to increase investment ranking of the backed security issue becoming dependent upon asset quality only. Therefore, in the process of decision making, the investor may focus exclusively on the asset quality (i.e. rights of monetary claims) as well as on the reliability of the structure of agreement under consideration. The rating margin forms a basis to benefit economically from securitization.

Nevertheless, the mechanism is not free from disadvantages. First of all, they are: high cost of the “true sale” (average pool of homogenous credits is 100 million USD); the necessity to disseminate confidential information concerning borrowers; grave legal obstacles; taxation problems etc.

That is why, taking into consideration the limitations, arising in the process of the classic scheme to securitize assets, its alternative model has been developed. Balance-sheet securitization is meant which anticipates that assets are still owned by a company initiating the securitization; consequently, the company issues individually securities backed by the assets (Fig. 3).



- 1) origination of debtors; 2) formation of homogenous asset pool; 3) issue and placement of debt securities, backed by homogenous asset pool and prospective income from them; 4) debt security payment; 5) debt service payment according to the agreements; 6) coupon payments to investors on the debt securities, and their cancellation when term of the debt repayment is over

Fig. 3. Model of the balance-sheet asset securitization.

Under such conditions, credit rating of issue of debt securities cannot be higher than credit rating of the issuer; in turn, the above prevents from cost cutting of the securitization initiator as for the debt servicing due to the high quality of the loan security. For instance, in the context of credit institutions, the method is expedient if asset pool is formed from low-risk credits, and their write-off may worsen qualitative characteristics of credit portfolio of the bank.

In such a case, exclusion of the securitized assets from bankruptcy of the initiator company takes place by means of asset pool separation from the total competitive amount and by means of legislative recognition of privilege of shareholders (i.e. investors) for the asset pool to compare with other creditors.

Typically, the world practices apply the balance-sheet model to hedge risks; if so, synthetic securitization is meant.

Basel Committee on Banking Supervision [25] interprets synthetic securitization from the viewpoint of a tool of credit risk management supposing that they are “the structured contracts where banks use credit derivatives to transfer credit risks of a certain asset pool to the third parties inclusive of insurance companies, other banks, and uncontrollable individuals”. Schengzhe Wang [24] believes that the synthetic securitization purpose is the use of credit derivatives to synthesize economic effect of traditional securitization.

Cornerstone of synthetic securitization is a mechanism in terms of which the securitized assets is not sold from the legal point of view remaining on the balance of the initiator company; at the same time, the risks, connected with the assets, are transferred to a market. Namely, to compare with the classic securitization, the synthetic model does not involve true sale of the assets. Separation of credit risk from the securitized assets is performed synthetically on the basis of credit derivatives, i.e. agreements according to which one party, acting as a protection seller, transfers a credit risk of a special debt or portfolio debt to another party (i.e. protection buyer) for a fee. In turn, the latter makes payment to the protection buyer if a risk (credit) event happens. In other words, credit risk becomes characteristic goods for which a market is made; in this context, a price of a credit risk of each borrower is determined by a mechanism of supply and demand.

A protection seller should understand clearly what problems will be solved with the help of the synthetic securitization in terms of each specific case; the information is the basis to select adequate structure which in turn can be implemented either using SPV or without its establishment.

Generally, synthetic securitization is a so-called method of credit risk mitigation (CRM) to hedge and expand risks connected with the securitized assets when the risks transfer synthetically from one party to another one, i.e. without basic liability sell.

Hence, by its economic nature, balance-sheet securitization (inclusive of synthetic one) simulates after-effects of the traditional securitization; however, despite that fact, they differ principally (Table 3).

Anyway, both off-balance-sheet securitization and balance-sheet one are financing mechanisms. In this context, their key difference is a method of asset pool placement, i.e. corresponding assets are either written-off from the balance of the securitization initiator or not. As a matter of fact, the above influenced the name of the securitization types. Certain agreements of a balance securitization (in particular regarding synthetic one) turn out to be cheaper to compare with the traditional one (i.e. off-balance-sheet) since SPVs are not established and

special structure to back sales conditions is not required. Moreover, off-balance-sheet securitization has numerous legal restrictions; thus, it is more expensive than balance-sheet one. In addition, selection of one or another securitization type governs rating of securities since their issuers will differ as well as risk transfer degree. What is more, influence on the indicators of financial and material state of the company will also vary.

Table 3. Comparative analysis of the balance-sheet asset securitization and off-balance one (generalization of materials [15; 18; 27]).

Comparison criterion	Securitization type	
	Off-balance	Balance
Asset pool placement	Write-off from the initiator's balance	On the initiator's balance
Issuer of securities	SPV	Initiator, SPV
Payment source on the principal debt and interest	Cash flow generated from the asset pool wrote-off from a balance	Asset pool (i.e. cash flow of an issuer)
Liability of an initiator	Within coverage of the credit as well as of extra security	Own capital liability
Bankruptcy of an initiator	No effect on the repayments	Bondholders have the prior right to satisfy their claims
Credit rating of securities being issued	High rating depends upon credit quality of the securitized assets	Depends completely upon the initiator rating
Credit risk bearer	Investor, insurers, SPV	Issuer
Bearer of a prior repayment risk	Investor	Issuer

5 Securitization influence on the indicators of financial and material state

Since off-balance-sheet securitization scheme involves the fact that the transferred SPV assets are replaced by the money raised from the sale of securities backed by the same assets, thus no significant changes take place in the asset value of the originator company; only their structure varies (Fig. 4).

Hence, asset separation to mitigate risks is possible if following basic conditions are fulfilled: use of a “true sale” scheme; bankruptcy protection; minimum of own SPV capital; and no originator-SPV consolidation.

In the process of balance-sheet securitization, asset value of the originator company, being also the security issuer, changes in their structure take place through the increased liquid assets which resulted from the security conversion (Fig. 5).

In other words, company assets represent the originator function and company liabilities represent the functions of issuer of the securities.

The abovementioned helps conclude that off-balance-sheet securitization, and balance-sheet one influence distinctly the financial and material condition of the originator company; first of all, that concerns such indicators as total balance, composition of assets and liabilities and their structure, indicators of liquidity and financial stability; indicators of financial results and profitability, and indicators of business activity (Table 4).

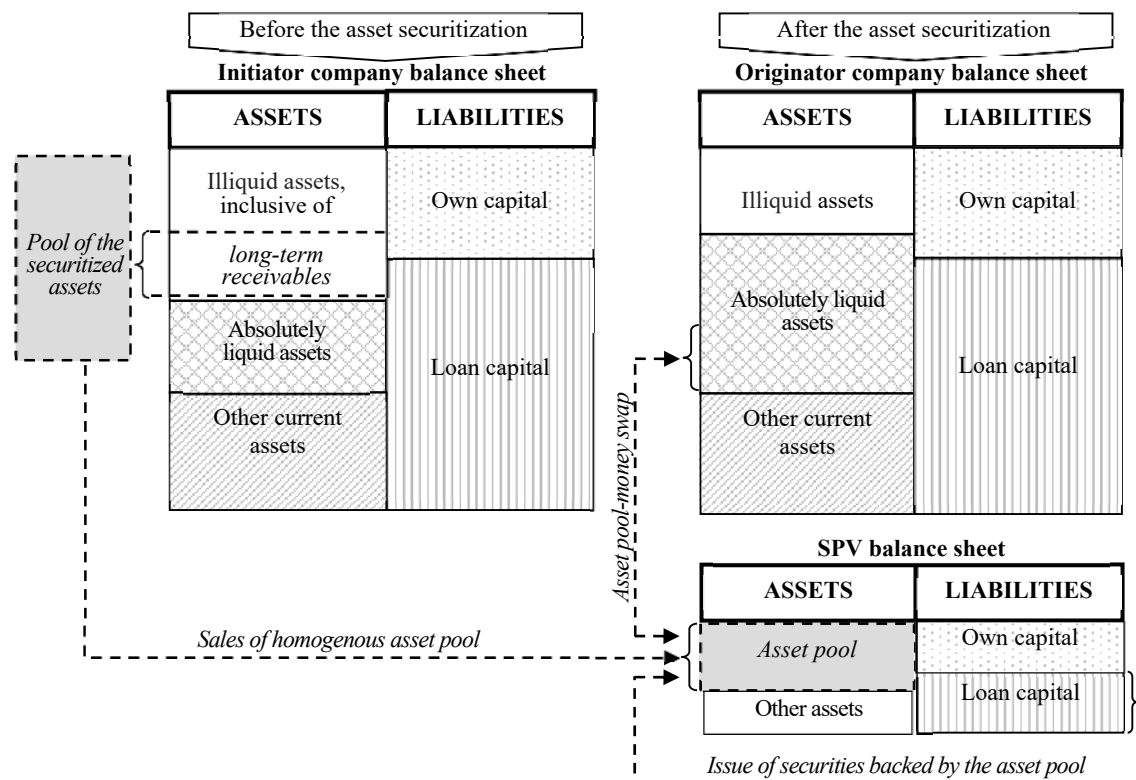


Fig. 4. Influence of the off-balance-sheet securitization on the balance-sheet indicators.

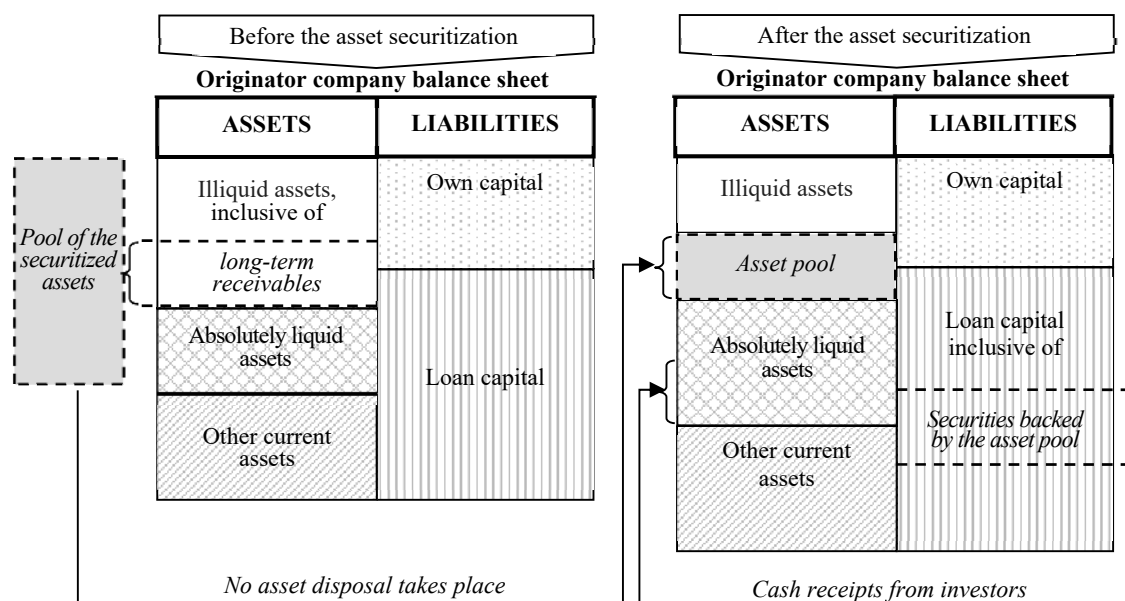


Fig. 5. Influence of the balance-sheet securitization on the balance-sheet indicators.

Consequently, significant changes in the total balance as well as in the structure of its liabilities take place in the process of the balance-sheet securitization when the total balance of the originator company increases by a cash pool attracted as a result of issue of securities backed by its assets. Therefore, value of the attracted capital increase as well as its share within the structure of liabilities.

Consideration of composition and structure of assets of a company should involve such a mention that under the conditions of the classical securitization, assets with low liquidity (for instance, long-term debit debts) are replaced by absolutely liquid assets, i.e. cash raised as a result of the securitized asset sales; in turn, that is followed by the increased share of liquid assets and the increased share of illiquid assets respectively.

Balance-sheet securitization also increases the amount of liquid assets at the expense of the money raised as a result of issue of asset-backed securities by the company. The both cases increase share of liquid assets which factors naturally into the improvement of liquidity indicators on the whole.

Moreover, the mechanism of asset securitization influences positively the amount of financial results as well as profitability indicators. Among other things, under the conditions of balance-sheet securitization, an originator company attracts extra capital and raises financial resources placed at corresponding profitability interest which increases indicators respectively indices of the financial results.

If the classical off-balance sheet asset securitization is meant, then the originator company loses the asset pool which brought regular profits. However, in the majority of cases, the originator services the payments arrived from debtors while receiving the fixed rate of interest from the payments. It should also be mentioned that the classical securitization scheme is applied to place the raised money more profitably to compare with the regular income being gained.

Hence, raising money, any enterprise can use it to

implement new relations inclusive of making extra profits in the form of asset interest-security interest margin which, in turn, favours increase in the fund turnover.

Moreover, asset securitization influences directly the process of formation of profits and expenditures since its mechanism involves management of flows of payments followed by payment of premia and fee charges as well as interest payments and interest-taking.

Further consideration of the problem should involve the fact that the weighted-average cost for asset securitization may be lower to compare with the current expenditures for financing attraction through banks or for other loan types. As a matter of fact, the use of the mechanism of off-balance-sheet securitization makes it possible to reduce financing cost at the expense of separation of risk of the originator from asset risk and upon condition that credit quality of the assets being securitized is higher than the credit quality of a balance sheet of the originator on the whole.

In the context of a balance-sheet securitization, issue of the backed debt securities helps attract financial resources at lower interest which reduces respectively the weighted-average cost of loan capital of the originator company.

However, the decreased cost of a loan capital in terms of the increased financial results, when the both asset securitization models are applied, factors into the growth of the company value.

Ye. A. Mitin [28] believes that asset securitization in financial institutions has a direct impact of the financial flows. In turn, the latter can be calculated and forecasted with the specific accuracy, and involved into the financial result; moreover, they can be distributed over interest yields, fee revenues, and management incomes. In this context, the scholar consider interest yields as the excess of interest payments by customers on the securitized assets over cost of investor satisfaction on the issued securities as well as premia to the agreement participants. No extra interest payments arise since the interest charges

are paid on the securitized credits; thus, their distribution has no relation to expenditures by the originator company.

Table 4. Changes in the financial indicators of a company under the influence of its asset securitization.

Direction of analysis	Securitization types	
	Off-balance-sheet (classical) securitization	Balance-sheet securitization
Asset valuation potential		
Balance-sheet currency	Minor changes take place per a difference value between balance-sheet value of the securitized assets, and their liquidation value	Increases by a total of issue of securities backed by the relevant assets
Value and structure of assets	Assets with low liquidity are replaced by absolutely liquid assets (i.e. money) which results in the increased share of liquid assets (i.e. cash) and the decreased share of illiquid ones (i.e. long-term debt debts or actual debts)	Asset amount increases by a total of money attracted in the process of issue of asset-backed securities which results in the increased share of liquid assets
Value and structure of liabilities	Minor changes are possible relative to the amount of liabilities at the expense of a difference between the balance-sheet value of the securitized asset pool and sales value. Moreover, the money, raised as a result of the securitization, may be applied to discharge the obligations	Loan capital total increase; hence, its share also increase along with the decrease in the own capital share
Financial potential valuation		
Liquidity indicators	Increase	Increase at the expense of long-term attraction of money
Indicators of financial stability	Remain almost invariable; however, loan funds-own funds ratio may decrease to the extent the money, raised during securitization, can be used to discharge the obligations	Decrease at the expense of the increased loan capital
Valuation of a company development and efficiency		
Indicators of business activity	Negotiability of assets (in particular, regarding money and debt debt) increases. Fulfillment of golden rule in economy is observed	Tendencies of increase and decrease in asset negotiability may happen depending upon the growth of the earned revenue, financial results, and asset value inclusive of the current assets
Indicators of efficiency	Financial results are improved at the expense of placement of the raised finance at the determined return	Profitability increases if growth rates of financial results exceed growth rates of relevant expenditures and assets
	Increase in profitability indicators inclusive of profitability of operational activity, profitability of assets (i.e. increase of financial results in terms of invariable asset value results in the asset profitability growth) etc.	

Consequently, fee revenues resulting from the asset securitization agreements are formed at the expense of originator company performance as a servicing agent; and legal representation of the security issuer in court if loan delinquency happens. Moreover, the originator company generates extra fees owing to the extension of new credits financed by means of the securitization. However, to organize asset securitization process, its initiator should bear sizable administrative expenses: fees paid to rating agencies and consulting agencies in the process of an agreement structuring; sourcing of additional personnel; and implementation of complex information systems.

Rather often, asset securitization is applied to improve capitalization indicators of credit agencies. Hence, in accordance with the current international rules, calculation of indicators of a bank capital adequacy should involve a value of a credit risk in terms of different asset items of the bank balance sheet. Thus, the use of the classical securitization mechanism by banks, feeling lack of own finance, helps them decrease a share of high-risk assets.

Consequently, securitization of bank assets favours the improvement of different financial ratios (e.g. capital turnover; debt-to-equity ratio; return on equity); relaxation in normative requirements relative to minimum amount of capital; and more efficient use of the capital and diversification of financial sources. The financial mechanism helps a bank raise extra profits, at the expense of the increased yield of bank operations, and reduce loan costs. Operational efficiency grows. Since mortgage securities are among the category of low-risk ones coupon rate on them is not high as a rule; even, it can be lower than interest on interbank credit which provides access to cheaper money.

6 Advantages and disadvantages of securitization

Like any implementation of a financial innovation, asset securitization has its own advantages and disadvantages. S. Yu. Salomatina [29], A. A. Bobyl [30] focus on the fact that securitization process helps increase the number of potential investors. S. Yu. Salomatina [29] mentions that securitization improves arbitrage rating of an originator. It means that the securitization initiator may count on higher securitization asset rating to compare with a proper one.

K. M. Isakov [31], D. I. Togonidze [32] and A. A. Bobyl [30] think that in the context of the bank institutions, initiating securitization, the demands, concerning their capital adequacy, turn out to be mitigated through credit risk transfer to the third parties. In elaboration of the abovementioned N. E. Bodrova [33] states that while securitizing, the originator decreases dependence of net assets upon the credit interest fluctuations; improves management of a bank assets and liabilities while decreasing dependence upon the difference in repayment periods in terms of credit transactions and debit ones. Yu. V. Bugel [34] points out at the fact that securitization helps solve a problem of the bank capital adequacy for credit transactions since it

decreases a share of problem loans within a credit portfolio structure thus favouring the decreased amounts of the required reserves to cover the credit risk. Moreover, the attractiveness of securitization tools as money investment objects is as follows: the securities help identify the credit risk level reasonably well; specialized rating agencies do that in the developed countries.

Analysis of the securitization advantages, singled out by different scholars, makes it possible to list the most important of them: finance cost reduction (since issue of the backed securities in the amount of more than fifty million dollars decreases expenditures connected with credit interest payment); risk management (i.e. all the risks are transferred to investors at the expense of payment structuring, and redistribution of liabilities); the improved balance sheet as well as access to liquidity (i.e. long-term assets are written-off from balance sheet of the originator which results in nonliquid asset replacement by cash being absolutely liquid); attraction of additional financing sources to carry on business, and to expand the activities; increasing the number of potential investors; prolongation of financing etc.

On the whole, asset securitization makes it possible to refinance activities of its initiator; to reduce and redistribute risks of the initiator connected with such assets; and manage a level of liquidity of the assets at the expense of changes in their structure. In this context, the methodology provides mutual diversification for the investors as well as for the securitization initiators. Among other things, investors are enabled to invest in assets, unavailable until then, through purchase of high-rating securities. The companies, which proper rating does not correspond to investment one, gain access to a capital market as well as to adequate refinancing (by means of issue of asset-backed securities evaluated by rating agencies as those of higher rating to compare with a primary owner of such assets).

Along with the advantages, the process of asset securitization is not free of disadvantages which make economic agents regard the use of such a financial innovation more carefully. According to the opinion of scholars, heavy expense involved to organize the process is among the most significant disadvantages. In such a way, experts believe that expenditures, connected with securitization, are not less than 3.5% of the cost of the liquidated assets.

I. M. Posokhov [35] and C. Kumpan [36] focus attention on the following fact: since assignation of security rating is paid for the originator, it is the originator that selects such rating agency which is ready to assign the issue the highest possible indicative rating.

A. A. Jobst [22], and K. M. Isakov [31] note that rather often originators form a pool from defective assets at the expense of the use of inefficient methods evaluating the asset pool which makes it possible for originators to ignore conditions of their reliability. I. M. Posokhov [35] emphasizes significant time loss during each stage of securitization formalization. R. J. Hahn [37] and D. I. Togonidze [32] pay attention to inefficient legislation since there are countries having no developed regulatory support for securitization (Ukraine is among those countries).

Table 5. Advantages and disadvantages as for the implementation of asset securitization mechanism.

Agents	Advantages	Disadvantages
Securitization initiator	<ul style="list-style-type: none"> • Access to capital markets and to adequate financing for those economic agents whose rating cannot correspond to investment one at the expense of asset-backed securities gained by rating agencies a much higher rating (it can be even higher than the issuer rating or country rating); • Hedging and eliminating of risks by means of their redistribution among participants; • Management method of a balance-sheet structure; • Diversification of financial sources; • Decrease in finance cost; • Meeting the criteria of own capital adequacy for bank institutions; • Improvement of economic indicators (i.e. liquidity, financial solvency, negotiability, and profitability); • Increase in the originator company status and its image (i.e. competitive growth); and • Increase in the number of investors 	<ul style="list-style-type: none"> • High cost of an agreement structuring; • Significant amount of the standardized (i.e. homogenous) assets; • Complexity and durability of a period for securitization agreement formalization in particular regarding off-balance sheet one from legal viewpoint (the necessity to enter into numerous contracts)
Investors	<ul style="list-style-type: none"> • High and stable ratings of asset-backed securities; • Ability to invest in assets differing in risk and profitability; • Low rate of default and bankruptcy of security issuer; • Higher asset-backed security premium is provided to compare with state-owned, bank, and corporate bonds with similar rating 	<ul style="list-style-type: none"> • Low level of monitoring of risks connected with underlying assets; • High rating of asset-backed securities irrespective of their quality; • Ability to form a pool from defective assets
National economy	<ul style="list-style-type: none"> • More effective risk distribution over the whole financial sector; • Easing of credits for non-legal entities, and higher duration of the credits; • Additional financing sources for real sectors of national economy; • Procurement of funds in terms of possibility of effective (i.e. low-risk) investment for retirement funds and insurance funds as well as for other institutional market players at the expense of transparency of major tranches; • Increase in the investment attractiveness of the country, and integration of the national financial market into the international capital markets 	<ul style="list-style-type: none"> • Securitization of low-quality assets in the uncontrolled amounts favours fictitious capital build-up; moreover, it may provoke financial crises

Generally, securitization schemes have its own advantages and disadvantages both for its initiator and investors depending upon distribution of risks and profitability determined with the help of the securitization type (i.e. either balance-sheet securitization or off-balance-sheet one); agreement structure (i.e. the number of tranches and their ratings); and parameters of financial tools being issued (Table 5).

Despite the abovementioned disadvantages, securitization pluses prevail; thus, it often considers as the best innovation of a century past since it involves high development potential both for financial market and for the national economy.

Consequently, securitization effect is of a large-scale microeconomic nature for the reason that the regularized securitization market helps increase efficiency:

- Allocations of financial resources in the economy by means of procurement of retirement, insurance, and other shareholders investing cash in asset-backed securities;
- Distribution of risks over the whole financial sector;
- Multiplier effect results from securitization. Hence, asset securitization became stimulus of economic growth for many developed countries. Namely, the huge funds attracted in the form of asset-backed securities may be used by real economic sector and become powerful stimulus to the accelerated economic development of a country.

7 Securitization in Ukraine

On the Ukrainian financial market only the beginning of the use of securitization as an innovative financing technique is observed, moreover the initiators, in almost all cases, were banking institutions, and mortgage loans were the subject of securitization (Table 6).

Thus, the first securitization transaction was carried out by Privatbank in 2007 worth USD 180 mln. and included about 10 thousand mortgage loans issued in US dollars to individuals in different regions of Ukraine. The mortgage pool was sold to a specially set foreign mortgage company “Ukraine Mortgage Loan Finance No.1”, established under the England and Wales’ legislation. Debts received investment ratings from international rating companies: the first tranche from Moody’s and the second one from Fitch.

A successful example of domestic on-balance sheet securitization was the issue of ordinary mortgage bonds of JSC JSB “UkrGasbank” in the amount of UAH 50 million in 2007. These bonds were in free circulation on the stock market, they were secured with the rights to claim mortgages previously issued by the bank, and the funds received from borrowers were used to pay income to the bondholders.

The peculiarity of this securitization transaction was that all its members were domestic institutions. The manager of the mortgage coverage was JSCB HVB “Bank Ukraine”, and the credit rating “UA BBB +” was assigned to this agreement by the Ukrainian rating agency “Credit Rating”. The bonds were issued at an interest rate of 10.5% per year for a period of 3 years. The face value of one bond was UAH 1000. A pool of 393 mortgages was

formed by mortgage coverage, which determined a coverage ratio of 89% [38].

Table 6. Statistics of Ukrainian originators’ agreements

Name of originator	Year	Amount of issue	Type of securitization	Type of asset	Financial instrument
PJSC CB “Privat-bank”	2007	USD 180 million	Off-balance sheet, SPV in London	Mortgage loans	RMBS (Residential mortgage-backed securities)
PJSC JSB “UkrGas-bank”	2007	USD 10 million (UAH 50 million)	On-balance sheet	Mortgage loans	CB (Collateralized Bond)
PJSC CB “Privat-bank”	2008	USD 104 million	Off-balance sheet, SPV in London	Car loans	ABS (Asset-Backed Securities)
PJSC CB “Khreshchatyk”	2008	USD 14,7 million (UAH 70 million)	On-balance sheet	Mortgage loans	RMBS
State Mortgage Institution	2008	USD 2,5 million	On-balance sheet	Mortgage loans	CB
PJSC “Leasing IT”	2008	UAH 15 million	Off-balance sheet	Leasing assets	ABS
JSC “Oschad-bank”	2013	USD 62 million (UAH 500 million)	On-balance sheet	Mortgage loans	CB

In 2008, PJSC CB “Khreshchatyk” made the next synthetic securitization in Ukraine in the amount of UAH 70 million. (USD 14.7 million) with a maturity of 3 years. This issue was regulated by national legislation. The rating agency Fitch Ratings assigned this agreement a rating of “B +”, which at the time of the conclusion of the agreement was higher than the rating of the issuer “B -”. An increase in the rating of issued bonds relatively to the bank’s rating by two points was facilitated by the fact that the security amount was above the legalized minimum of 11.1% as well as the prevailing right of bondholders to the pool of assets. Nevertheless, this rating, both for bonds and for the issuer, is low enough, due to the imbalance of the bank’s assets and liabilities by maturity. In its report, Fitch Ratings noted that there was a discrepancy between the cash flow of depreciation of the collateral and the redemption of the secured bonds, which in turn was not offset by the availability of liquid assets or any other mechanism. Thus, as of August 1, 2008, PJSC CB “Khreshchatyk” formed a pool of assets of 403 loans worth UAH 80.6 million. Of these, home loans accounted for 86.6%, but according to domestic legislation, in the formed pool home loans provision should be no more than 75% [39].

The issue of bonds of a securitized leasing portfolio amounted UAH 15,000,000 (when placing bonds with

further increase due to spread reinvestment) in 2008 was significant for the Ukrainian financial market. First of all, it was the first in Ukraine securitization of the assets of a non-bank institution; secondly, this was the first time the classical securitization was conducted in the domestic market, i.e. the issue of bonds was carried out by a specially created domestic company LLC “Leasing IT-SPV”, in the Charter of which obligatory attributes specific to classical securitization were predicted (restriction in activities of the issuer, the presence of a special management body, the impossibility of bankruptcy and liquidation of the issuer until the end of settlements with all creditors (bondholders) and confirmation of the appropriate decision by their convocation). The subject of securitization was the financial leasing of IT equipment and the sale of goods by installments for small and medium businesses (SMEs) (10% of the portfolio), as well as individuals (90% of the portfolio).

The issue is structured as a securitization with the real sale of the financial assets of a special company’s purpose, with the further possibility of replenishing the asset pool with new leasing agreements. Leasing assets were on a separate balance sheet and were the main security for the issued bonds. At the same time, despite the considerable excess spread of profitability on the portfolio of the transferred leasing assets, the issuer’s obligations under the Series A bonds were additionally secured by the guarantee of the originator - PJSC “Leasing IT”. Securitization was a revolver, that is, leasing payments were used to finance new agreements to fill the portfolio [40].

The last securitization transaction was carried out in 2013 by JSC “Oschadbank” through a subsidiary mortgage company, the Home Loans Refinancing Agency (HLRA), which issued two series of mortgage bonds under Ukrainian law, for a total amount of UAH 500 million.

Thus, from 2007 to 2013, 7 securitization transactions were conducted, 4 of which were balance sheet financing and 3 were off-balance sheet, with two cross-border securitizations and only one with the creation of a domestic SPV. In addition, in 6 cases, bank assets were securitized, including: 5 times – mortgages and only once – car loans. Securitization of assets of the leasing company was also conducted once.

The main obstacle to the development of the asset securitization market in Ukraine is the lack of adequate legislative support for such a financial mechanism, which further increases the risks for investors. In addition, insufficient homogeneous assets available for securitization; lack of institutional investors interested in investing in securities of domestic companies, as well as lack of qualified personnel with experience or knowledge in entering into such agreements should be mentioned.

In the case of the adoption of legislation that extends securitization to non-mortgage assets, the domestic economy can be significantly revived by the influx of investments in certain industries and projects, especially infrastructure ones. Thus, stimulating the attraction of investments in long-term projects for the development of transport, energy, housing and communal infrastructure as

well as social infrastructure can be realized in the form of launching of the infrastructure bonds circulation, for which the fulfillment of obligations is secured by the assets generated by borrowed funds – payments for usage, subscription fee, fees and more. Obviously, the use of securitization of monetary claims in Ukraine will facilitate large-scale financing of the real economy sector, such as house building, local industry, energy conservation and more.

8 Green securitization as the major tool of sustainable investments market development in Ukraine

Sustainable global economy should combine long-term profitability with social justice and environmental care, because global environmental issues have posed new challenges and tasks for society to reduce their negative environmental impact.

“Green” economy is the basis for the implementation of the sustainable development concept based on more efficient resource and energy consumption, reduction of CO₂ emissions, reduction of harmful environmental impact and socially integrated society development. As a result, the change in the “trajectory” of the global economy towards sustainable development increasingly determines the desire of governments, TNCs, institutional investors and households to mobilize green investments in low carbon and climate-sustainable infrastructure, the development of renewable energy, conducting industrial and energy modernization, etc. [41].

The large-scale implementation of climate protection projects, the latest resource and nature conservation technologies and environmentally friendly measures to realize the “green” growth of national economies requires strong financial support and, accordingly, requires “reformatting” of current and future investments, and finding alternative financing sources.

Many sustainable investments require long-term loans that diverge from capital and deposits that make up bank balances. In order to provide alternative financing and unleash the balance sheet potential for sustainable assets, illiquid sustainable bank loans can be repackaged to a more liquid format to attract sustainable investors in global capital markets. These issues can be resolved by combining and using sustainable assets through sustainable securitization.

Securitization is envisaged to become one important de-risking instrument that would successfully crowd in private (institutional) investors and scale up sustainable assets. The structural ambition of the securitization for sustainability agenda is to reorganise DEC financial systems from bank-based to capital-markets based models. The structural transformation of financial systems towards securities market-based finance is necessary so that the trillions of institutional investors can find their way into sustainable projects. At country level, it is argued that securitization would pave the way for a more resilient financial system while allowing countries to redirect scarce fiscal resources where most needed [42].

Anna Bak, Associate Director of Securitization at AFME, said: “There is huge potential for green securitization to help expand environmentally sustainable investments in the short term. Green securitization could play an important role in helping to achieve the EU’s 2030 climate and energy targets by financing deals and investment in low-carbon assets, which would help to close the investment gap estimated at EUR 180 billion per year. However, there is still more work to do to help make this market more attractive and user-friendly for investors” [43].

Today, the first results of green securitization are evident in a number of the economy sectors the development of which has an impact on the achievement of the Sustainable Development Goals.

LGFAs from Norway, Sweden, Finland and Denmark as well as Dutch bank NWB have all issued green bonds, raising USD 9.5 billion between them since 2010. Three PACE financing providers from California have issued green ABS backed by PACE loans [44].

Solar City (now Tesla Energy) issued the first one in 2013: a USD 54 million deal backed by cash flows from power purchase agreements for the electricity generated by a bundle of residential rooftop PV installations of around 5,000 customers. In total, the company has placed 9 solar ABS deals. In Canada, Northland Power’s 2014 ABS is backed by revenue from the 20-year feed-in tariff contract between the company’s solar projects and the Ontario grid. FlexiGroup issued the first Australian deal with a green ABS tranche. It refinanced a pool of loans extended to customers for residential rooftop solar. The bond was Certified under the Climate Bonds Standard for Solar assets [44].

Fannie Mae issued USD 26.4 billion of labelled Green MBS in 2017, significantly above the USD 3.5 billion issuance volume achieved in 2016. It is the largest green bond issuer for 2017 [44].

Dutch lender Obvion issued the first green RMBS in 2016. Together with its Green Storm 2017-1, the mortgage lender has now placed USD 1.3 billion of green RMBS. In 2018, National Australia Bank issued an AUD 2 billion RMBS with an AUD 300 million green tranche. All three green issues have been Certified against the Climate Bonds Standard for Low-Carbon Buildings (Residential) [44].

CSAIL, a joint platform of the US operations of Credit Suisse and Natixis, issued the first CMBS deal with green subordinated notes. They are secured on a LEED Platinum certified office building on Wall Street in New York City. But it is China that recorded the first green CMBS – a three-tranche deal secured on a LEED Gold certified office building owned by China Energy Conservation and Environmental Protection Group (CECEP) [44].

Green covered bonds under German Pfandbrief legislation were first issued by BerlinHyp in two EUR500m deals in 2015 and 2016 (USD 1.2 billion in total). Deutsche Hypo followed with a EUR 500 million deal in 2017. In 2018, SpareBank 1 Boligkreditt, the covered bond vehicle of an association of Norwegian savings banks, issued a EUR 1 billion green covered bond with a residential mortgage cover pool [44].

Chinese issuers have issued 11 ABS deals totaling USD 2.4 billion and secured on receivables from wind turbines and other renewable energy equipment leasing, public transport, water and waste management: by far the most diverse sector range among countries with green ABS issuance [44].

Toyota Finance has issued USD 4.6 billion in three green ABS secured against the cash flows from existing car leases and with the proceeds destined to finance new leases and loans exclusively on hybrid and electric vehicles. Using existing “brown” assets to free up capital for more “green” ones is a key component of financing the low-carbon transition [44].

Brazil’s innovative securitization instrument has helped farmers and cooperatives secure financing for the production, sale, processing or industrialisation of agricultural products [44].

Credit rights deals have been successful thanks to the competitive loan pricing they offer farmers, the asset-liability match and the tax exemptions for both investors and issuers. In 2016, Suzano Papel issued the first – and so far, only – green CRA ABS of BRL 1 billion (USD 295 million) [44].

The “green” approach global trends, which began to take shape over the last decade in various spheres of public life, are being introduced more and more widely in our country.

In Ukrainian realities, the successful implementation of the “green” economy concept aimed at achieving sustainable development goals can be ensured by the use of green securitization through the collateralized loan obligation mechanism.

Currently most infrastructure projects are funded by bank loans. Infrastructure projects require long term financing which is sub-optimal from a risk weighting perspective; further, most banks are funded on short-term debt or on demand deposits thereby creating a maturity mismatch with longer term projects. Therefore, a mechanism is needed to move project loans from bank balance sheets to bond market investors who are the natural long-term investors in sustainable infrastructure. This mechanism is securitization – the sustainable CLO [45].

Collateralized loan obligations (CLO) are structured financial transactions where certain types of loans, usually highly leveraged syndicated commercial credits, are pooled together and transferred to a trust entity called a SPV. The commercial credits are usually loans issued by financial institutions that are funding high-risk ventures such as leveraged buyouts. The SPV then issues debt to investors to fund the purchase of these loans, and the principal and interest payments that are generated by the loans are paid to investors over time (Fig. 6).

The generic CLO structure envisages the purchase of a pool of loan participations by a Special Purpose Vehicle (SPV) financed by the issuance of tranches of rated securitized bonds (CLO tranches) and unrated “equity”. The CLO tranches are rated by credit rating agencies according to their seniority within the capital structure with the senior most tranche considered the least risky and the equity being the riskiest tranche. A broad range of investor groups purchase the tranches based on their

individual risk and return preferences and investment criteria. An asset manager typically manages the underlying pool of loans by constructing a portfolio and optimizing portfolio performance. By transferring the credit risk of the underlying loan portfolio to bond investors via securitization, CLOs have accelerated loan issuance, freed up bank lending capacity and thereby expanded overall credit formation. The same principles can be applied to the sustainable loan market to accelerate credit formation for sustainable projects [45].

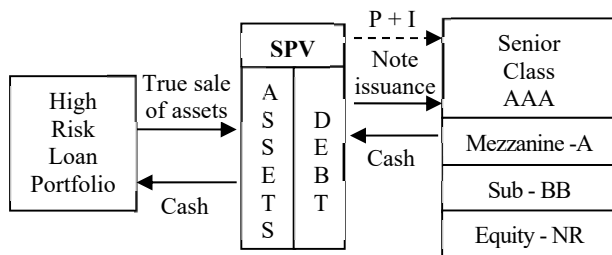


Fig. 6. CLO Example [46].

Sustainable projects can offer institutional investors a range of desirable financial characteristics and funding horizons. For example, the debt repayments from completed projects are typically equivalent to investment grade credit risk and feature stable and predictable cash flows, often with inflation protection due to power price linkage. Wind and solar projects also have an estimated 25-year lifespan with manufacturer warranties and long-term contracts with power purchasers and government support. Assets like these provide the long-term income preferred by many institutional investors and CLOs can provide institutional investors access to these assets while improving the risk-adjusted returns with an optimum liability structure which works through economic cycles [45].

So, due to the securitization of assets, banks not only get rid of bad debt (replacing it with bonds), but also gain the ability to effectively control all debt collection processes (while continuing their service). At the same time, the bank completely eliminates the lengthy burdensome procedures preceding the write-off of bad assets to maturity of assets from the balance sheet. The originator bank is able to repay some of the money in the case of a discounted sale of senior series of subordinated bonds to investors, the amount of which is calculated in the amount of the most probable return on assets. Releasing banks from problem assets is a prerequisite for recovery of bank lending.

Sustainable CLOs will be a pillar of the sustainable securitization revolution. The supply of assets for this product is plentiful and given the vast commitments by financial institutions to increase the quantity of sustainable loans on their books, this is set to continue [1].

We consider that for the development of green securitization in Ukraine, first of all, it is necessary to attach an implicit government guarantee to green finance structures. That would give them a covered bond-type flavour, potentially making the instruments more attractive to investors by lowering the possibility of default. Government backing could stimulate the retail

green bond market in particular, where considerable public interest in environmentally-related projects already exists. Other initiatives could include lowering the tax threshold for institutions that use green financing, or offering tax relief on the income from green bonds.

Securitization is rather complex and expensive but highly efficient financial mechanism. In the context of Ukrainian capital market, securitization may become the helpful tool to attract financing and investing, including in the transition to a green economy.

9 Conclusions

Under the conditions of dynamic development of a financial market and economy on the whole, securitization is one of the innovative tools to attract additional finance, to increase liquidity level, to diversify assets, and to minimize risks in the financial markets. It is cheaper refinancing mechanism to compare with other methods of getting funding since emitter can issue securities with higher rating and, consequently, with lower interest by contrast to long-term loan interest.

Lack of adequate legal support for such a financial mechanism is the basic obstacle preventing from the development of asset securitization market in Ukraine, and increasing risks for investors more and more. Still, amounts of homogenous assets, being suited for securitization, are not sufficient; there are no institutional shareholders interested in the investment in the securities of national companies; and there is no qualified personal having either experience or knowledge to draw up such contracts.

At large, balance-sheet securitization as well as off-balance-sheet one influences positively of financial indicators of its initiator. To begin with, asset securitization becomes efficient at the expense of conversion of low-liquidity money claims to highly liquid tools of a capital asset market.

Successful implementation of the concept of a “green” economy aimed at achieving sustainable development goals can be ensured by mobilization of financial resources with the goal of setting the transition to low carbon and resource efficient economic development. We believe that sustainable securitization, in particular green securitization based on the use of the collateralized loan obligation (CLO) mechanism, should become an effective tool for creating new opportunities for attracting financing and development of the domestic sustainable investments market in Ukraine. However, the underlying asset pool may include financial assets such as mortgages on certified buildings, for example, in accordance with LEED, BREEAM, Energy Star or other building codes; mortgage financing to improve energy efficiency; loans or lease payments for electric vehicles; loans or lease payments for solar and wind assets; energy efficiency loans; cash receipts from ESCO contracts or sale of GHG permits etc.

Sustainable securitization based on collateralized loan obligation may be relatively new with a limited number of deals so far, but the diverse range of financial assets and structures used bodes well for the growth of this type

of debt instrument.

In Ukraine, in order to achieve sustainable development goals, the presence of such an instrument in the arsenal of banks and corporations as Sustainable Securitization, is able to fundamentally improve liquidity in the “green” financial market, in particular financing of socially significant risky investments with a long payback period and low profitability or large-scale infrastructure projects aimed at environmental protection.

References

1. C. McGarry, D. Dey, M. Hauman, Sustainable Securitization (2018), <https://www.whitecase.com/publications/alert/sustainable-securitization>. Accessed 25 Feb 2020
2. Worldwide Securitization Volume. Asset-Backed Alert (2019), <https://www.abalert.com/rankings.pl?Q=105>. Accessed 15 Feb 2020
3. Securitization Data Report. ASIFMA (2019), <http://www.asifma.org>. Accessed 15 Feb 2020
4. Securitization Data Report. AFME (2019), <http://www.afme.eu>. Accessed 15 Feb 2020
5. Securitization Data Report. SIFMA (2019), <http://www.sifma.org>. Accessed 15 Feb 2020
6. ASIFMA Securitization in Asia (2018), <https://www.asifma.org/wp-content/uploads/2018/09/asifma-2018-securitization-handbook-final-003.pdf>. Accessed 15 Feb 2020
7. E. Engelen, A. Glasmacher, The waiting game: How securitization became the solution for the growth problem of the Eurozone. *Competition & Change*, **22(2)**, 165–183, (2018). doi:10.1177/1024529418758579
8. European Structured Finance. AFME (2019), <https://www.afme.eu/Portals/0/DispatchFeaturedImages/AFME%20Securitization%20Data%20Report%20Q3%202019-1.pdf>. Accessed 15 Feb 2020
9. A.E. Molotnikov, *Pravovoe regulirovanie rynka czennykh bumag* (Legal regulation of the securities market). (Startap, Moscow, 2013)
10. Green finance and investment. Mobilising bond markets for a low carbon transition (OECD Publishing, Paris, 2017)
11. S.L. Schwarcz, The Alchemy of Asset Securitization. *Stanford Journal of Law Business and Finance* **1(1)**, 133–154 (1994)
12. A.O. Soldatova, *Faktoring i sek'yuritizatsiya finansovykh aktivov* (Factoring and securitization of financial assets). (Vysshaya shkola, Moscow, 2013)
13. A.A. Kazakov, Risk management in securitization. *Bank crediting* **5** (2008)
14. J. France, R. Berry, *Pan-European Securitization* (London, 1992)
15. H.P. Bär, *Sek'yuritizatsiya aktivov: sek'yuritizatsiya finansovykh aktivov – innovatsionnaya tekhnika finansirovaniya bankov* (Asset securitization: securitization of financial assets – an innovative technique for bank financing). (Volters Kluver, Moscow, 2007)
16. V.I. Vagizova, Razvitie otnoshenij sek'yuritizatsii khozyajstvuyushhikh sub'ektov v ekonomicheskoy sisteme: otechestvenny'j i zarubezhny'j opyt (The development of securitization relations of business entities in the economic system: domestic and foreign experience). *Problemy sovremennoj ekonomiki* **4** (28), (2008), <http://www.m-economy.ru/art.php?nArtId=2273>. Accessed 21 Dec 2019
17. J. Tavakoli, *Collateralized Debt Obligations and Structured Finance: New Developments in Cash and Synthetic Securitization* (John Wiley & Sons, 2004)
18. A. Davidson, A. Sanders, L. Wolff, A. Ching, *Securitization: Structuring and Investment Analysis* (John Wiley & Sons, 2003)
19. C. Eroukmanoff, Securitization Theory: An Introduction (2018), <https://www.e-ir.info/2018/01/14/securitization-theory-an-introduction>. Accessed 18 Dec 2019.
20. A. Kara, D. Marques-Ibanez, St. Ongena, Securitization and credit quality in the European market. *European Financial Management* **25(2)**, 407–434 (2019). doi:10.1111/eufm.12168
21. M. Bakoush, R. Abouarab, S. Wolfe, Disentangling the Impact of Securitization on Bank Profitability. *Research in International Business and Finance* **47**, 519–537 (2019). doi:10.1016/j.ribaf.2018.09.013
22. A. Jobst, Sovereign Securitization in Emerging Markets. *Journal of structured Finance* **12(3)** (2006), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=929568. Accessed 12 Nov 2019
23. Application Guide: Securitization (2018), https://www.dico.com/design/Publications/En/Securitization/ApplicationGuide_Securitization_2018.pdf. Accessed 15 Nov 2019
24. A.V. Bogucharskov, Renewal of Securitization Mechanism Using Blockchain Technologies. *Finance and Management* **4**, 47–55 (2017). doi:10.25136/2409-7802.2017.4.24784
25. Section 68. *The New Basel Capital Accord*. Consultative Document Asset Securitization. Basel Committee on Banking Supervision (2001), <https://www.bis.org/publ/bcbcsa03.pdf>. Accessed 10 Nov 2018
26. S. Wang, True Sale Securitization in Germany and China (2004), <http://www.true-sale-international.de>. Accessed 18 Oct 2019
27. F.J. Fabozzi, *Mortgage-backed securities: products, structuring, and analytical techniques* (Wiley, Hoboken, 2007)
28. Ye.A. Mitin, Vliianie sek'yuritizatsii ipotechnykh kreditov na finansovyi rezul'tat deiatel'nosti kreditnoi organizatsii (The impact of securitization of mortgage loans on the financial performance of a

- credit institution), Dissertation, Plekhanov Russian University of Economics, 2011
29. S.Yu. Salomatina, Securitization: terminology aspect. Concept **8**, 23–24 (2014), <http://e-koncept.ru/2014/14222.htm>. Accessed 29 Oct 2019
 30. V. Bobyl, M. Solovei, Sekiurytyzatsiia bankivskykh aktiviv u konteksti upravlinnia portfelnykh kredytnym ryzykom (Securitization of Bank Assets in the Context of Portfolio Credit Risk Management). Visnyk Natsionalnoho banku Ukrainy **1**, 22–25 (2010)
 31. L.N. Drobyshevskaya, Ye.V. Yumasheva, K.M. Isakov, Instrumenty diversifikatsii kreditnykh riskov kak faktora modernizatsii ekonomiki (Tools for diversification of credit risks as a factor of economic modernization). Nauchnyy zhurnal NIU ITMO. Seriya: Ekonomika i ekologicheskyy menedzhment **2(9)**, 10–11 (2011)
 32. D.I. Togonidze, Teoreticheskie podkhody i vidy sek'yuritizirovannykh aktivov (Theoretical approaches and types of securitized assets). Finansovaya analitika: problemy i resheniya **37(79)**, 52–55 (2011)
 33. N.E. Bodrova, Sekiurytyzatsiia aktiviv yak innovatsiina forma refinansuvannia bankiv ta problemy yii vprovadzhennia v Ukraini (Securitization of assets as an innovative form of refinancing of banks and problems of its implementation in Ukraine). Nauka i ekonomika **4(24)**, 8–10 (2011)
 34. Yu.V. Bugel, Sekiurytyzatsiia yak metod optymizatsii upravlinnia ryzykom kredytnoho portfelia komertsiiynykh bankiv (Securitization as a method for optimizing the risk management of the loan portfolio of commercial banks). Visnyk Chernivetskoho torhovelno-ekonomichnoho instytutu KNTEU **3**, 228–232 (2010)
 35. I.M. Posokhov, Aktualnost sekyuritizatsii riskov v strakhovanii i perestrakhovanii v sovremennykh usloviyakh (The urgency of securitization of risks in insurance and reinsurance in modern conditions). Finansy **31**, 12–19 (2012)
 36. C. Kumpan, Conflicts of Interest in Securitization: Adjusting Incentives. Journal of Corporate Law Studies **9**, 261–295 (2009)
 37. R.J. Hahn, Securitization: An Introduction (2005), http://www.hunton.com/files/tbl_s47Details/FileUpload265/1274/Securitization_AnIntroduction_Hahn.pdf. Accessed 15 Oct 2019.
 38. N.G. Volyn, Sek'yurytyzatsiia bankivskykh aktiviv yak metod upravlinnia portfelnykh kredytnym ryzykom (Securitization of bank assets as a method of managing portfolio credit risk). Derzhava ta rehiony **2**, 214–219 (2011)
 39. I.A. Kolosinskij, Statistika sdelok sek'yuritizatsii ukrainskikh originatorov (Statistics of securitization transactions of Ukrainian originators), <http://www.securitization.com.ua/search?updated-min=2014-01-01T00:00:00%2B02:00&updated-max=2015-01-01T00:00:00%2B02:00&max-results=4>. Accessed 12 Dec 2018
 40. Sait kompanii PrAT “Lizynh IT” (Website of JSC Leasing IT) (2014), <http://web.archive.org/web/20190208231157/http://www.leaseit.com.ua/>. Accessed 10 Apr 2020
 41. K. Markevy`ch, “Zeleni” investy`ciyi u stalomu rozvy`tku: svitovy`j dosvid ta ukrayins`ky`j kontekst (“Green” investments in sustainable development: world experience and the Ukrainian context). (Tsentr Razumkova, Kyiv, 2019), http://razumkov.org.ua/uploads/article/2019_ZELE_N_INVEST.pdf. Accessed 13 Feb 2020
 42. D. Gabor, Securitization for Sustainability (2019), https://us.boell.org/sites/default/files/gabor_finalized.pdf. Accessed 13 Feb 2020
 43. R. Hansford, AFME says potential for green securitization is huge (2019), <https://www.afme.eu/news/press-releases/detail/afme-says-potential-for-green-securitization-is-huge>. Accessed 13 Feb 2020
 44. G. Rado, Green Securitization. Unlocking finance for small-scale low carbon projects (2018), <https://www.climatebonds.net/resources/reports/green-securitisation-unlocking-finance-small-scale-low-carbon-projects>. Accessed 13 Feb 2020
 45. Towards a sustainable infrastructure securitization market: the role of collateralised loan obligations (CLO) (2018), http://unepinquiry.org/wp-content/uploads/2018/12/Towards_a_sustainable_infrastructure_securitization_market.pdf. Accessed 15 Feb 2020
 46. R. McDonough, Collateralized loan obligations. (2016), <https://www.gfmi.com/articles/collateralized-loan-obligations>. Accessed 15 Feb 2020