Problems of International, National and Regional Economy

BESLI | Business, Economics, Sustainability, Leadership and Innovations | Ukrainian-American Concordia University

Joint Scientific Journal

УДК 339.72
JEL Classification F34

Arutyun W. Amalian
Nataly D. Amalyan

Gdp-Linked Warrants: Theory and Practice

The paper provides a review of theoretical and practical aspects of GDP-linked warrants emission. Theoretical problems related to these securities are explored by way of comparison of original GDP-linked bonds and GDP-linked warrants, issued in the course of debt restructuring; practical aspects are examined by means of a comparative overview of terms and conditions of most recent emissions of such financial instruments by Argentina, Greece, and Ukraine. Intrinsical discrepancies between theory and practice, combined with detected trends of tightening of terms and conditions of each successive emission, qualify authors for rationalization of the need of national and international monitoring over foreign debt restructuring negotiations.

Keywords: GDP-linked warrants, moral hazard, Ukraine, debt restructuring negotiations, monitoring.

10.37659/2663–5070–2020–4-18-25

Introduction

In 2015 while negotiating ways and means of restructuring of Ukrainian sovereign debt and practicality of the emission of GDP-linked warrants it was a common knowledge that "previous issuances of GDP-linked securities have been hampered by flawed, incomplete contracts and by moral hazard, pricing and liquidity issues" (Park S., Samples T., 2015). That is why in 2015 the main task of creditors was to "address some of these shortcomings with meaningful improvements in contract design".

As it turned out, from the point of view of creditors this task was successfully completed: issued in 2015 GDP-linked warrants (i) provided for independent sources of GDP data to damp down investors' concerns about data manipulation; (ii) included cross-series collective action clauses, simplifying the process of modification and/or restructuring of securities, if necessary; (iii) provided tailored mechanisms for investor protections, reading into the contract put options, instrumental in case of certain covenant violations. In many respects due to these covenants Ukrainian GDP-linked warrants in 2017 have surged more than 50%, at the end of 2019 were traded at a cash price of 98% (Hogg R. 2020) at the beginning of 2020 (before Covid-19 pandemic) they had hit par (Ukraine's GDP, 2020) and on January 2020 even exceeded nominal by 0.13%. Such widely acknowledged success of these warrants has solidified some eminent scholars' opinion on the expediency of full-scaled primal (original) GDP-linked notes the issuance (by contrast with

the emission of warrants in the course of debt restructuring).

Literary Review

The start of the first wave of interest to GDP-linked securities is dated by the late 1980s, when the process of Brady bonds emission was initiated. Generally recognized presumption that partial debt forgiveness can actually raise the expected repayments to the creditors, and at the same time give greater incentive to the country for favorable adjustment (Sachs J., 1989), has triggered the search of reasonable ways of sovereign debt restructuring – both in practice and in academic literature. In conjunction with Costa Rica, Bulgaria, Bosnia and Herzegovina issuing bonds with certain elements of indexation to their national GDP (or GDP per capita or GDP growth), the issue of GDP-linked warrants became high-profile topic in the research papers of Robert Shiller (1993), John Williamson (2005), Eduardo Borensztein and Paolo Mauro (2002), Stephany Griffith-Jones and Krishnan Sharma (2006), Joseph Stiglitz (2010) and others.

Pursuant to their research GDP-linked warrants (also known as Value-Recovery Rights – VRR or Growth Linked Warrants – GLW) were the new class of securities, issued in the process of debt restructurings with a purpose of compensating investors who let part of their principal and/or interest disappear in a restructuring by way of promising a share of the 'better future' (always providing only an upside, never a downside).

Next wave of interest to GDP-linked securities is associated with the possibility of the emission of original GDP-linked bonds – securities to be issued within the context of a long-term treasury management program that aims to address a problem of financial needs of the sovereign in the context of economic cycles; primary objective of such securities – to lay the groundwork for correlation of the payments on principal amount and/or interest with some sort of GDP index.

On 30 November, 2015, participants of the workshop on GDP-linked bonds, hosted by the Bank of England, "broadly endorsed the benefits of GDP-linked bonds – of fiscal policy stabilization, contractually-agreed risk-sharing, avoidance of the deadweight costs of debt crises" (Bank, 2015); arising from this meeting of economists, lawyers and businessmen was the presentation of the indicative term sheet for such securities 'The London Term Sheet' (English law version).

At the top level the idea for sovereign contingent debt was revived at the G20 meeting in Chengdu, China, in 2016. Meeting next year in Baden-Baden G20 finance ministers and central bank governors endorsed a "Compass for GDP-linked bonds", which was developed jointly by the G20 countries, stating that GDP-linked bonds could be instrumental in improving the sustainability of public finances.

Comprehensive analysis of the theoretical problems of GDP-indexed securities is provided in the papers of almost all already mentioned experts; their main arguments were recently consolidated in collection of essays 'Sovereign GDP-Linked Bonds: Rationale and Design', edited by James Benford, Jonathan Ostry and Robert Shiller (2018). Virtually all of them handled the problem from the point of view of creditor/investor.

The **main objective** of this paper is to look into the matter from the point of view of the issuer of GDP-linked warrants/bonds (based on the comparative analysis of background, terms and condition of GDP-indexed bonds issued by Ukraine with those of Argentina and Greece).

Analyses

Summarizing main arguments of the advocates of GDP-linked bonds and/or warrants, assessing them from investors' perspective, it is essential to mention the following:

- GDP-linked bonds, referred to by Robert Shiller as the "mother of all markets", are determined as "perpetual claims" (Shiller R., 2018) on country wealth. These securities are designed in order to provide for investors an opportunity to take a position on countries' future growth prospects, thus being a "claim on the income of an entire economy" (Kopf C. in Sovereign GDP, 2018, pp. 74–75).
- VRR are the financial instruments to be traded on the market of behemoth size: in 2019 global GDP surpassed $142 trillion; its size far outweighs capitalized value of world's stock markets.
- GDP-linked securities allow investors to better diversify their portfolio both domestically and internationally; when GDP-linked bonds will be issued by a number of countries, investors will expect high returns when some of these countries do very well.
- GLW securities due to their design are believed to offer higher level of protection against payment default in the long run.

Advocates of GDP-linked securities also describe some advantages of GDP-linked securities from the point of view of sovereign obligors:

- VRR increase the issuer's resilience to negative growth shocks by linking debt payments to the issuer's capacity to service debts.
- GDP-linked security is an attractive instrument "because it can ensure that debt stays in step with the growth of the economy in the long run and can create fiscal space for countercyclical policies during recessions (Sovereign GDP-Linked, 2018, p.14). Shifting the fiscal burden of sovereign debt to the more favorable economic scenarios, they are devised as an automatic stabilizer.
- GLW is an instrument of international risk sharing; GDP-indexed bonds allow the indebted sovereign to enhance country's external viability, growth and integration into the world economy.

Proceeding from numerous advantages of GDP-linked securities, lawyers, economists and financial experts at

present are keeping on the front-burner practical issues of the design of such securities, the main of them being choice of the index, method of its measurement, data quality concerns, currency denomination, recourse period, pricing, uncertainty about liquidity, questions of contractual design and availability of covenants. This paper is dealing mainly with economic issues, leaving legal technicalities (such as problem of Governing law, Collective action clause, Pari passu clause and other covenants) to legal experts.

Dealing with economic problems any economist should start with the clarification of economic essence of VRR. According to Investopedia, warrants, being just one type of equity derivative (Fairly A., 2020), give the right, but not the obligation, to buy or sell a security – most commonly an equity – at a certain price before expiration. As a Spanish multinational financial services company Banco Bilbao Vizcaya Argentaria (BBVA) specifies, "a **warrant** is a **securitized option.** In other words, an option on an asset in the form of a security that has an official listing, and it is traded in an organized market. Its price is therefore set transparently" (Furio E., 2020).

Thus by analogy the GDP-linked warrant can be determined as a derivative (the price of which is defined by the share of hair-cut), that gives investors the right to receive part of the issuer wealth – certain proportion of GDP.

Academic papers describe VRR as a debt instrument in the context of international risk-sharing (Athanasoulis S. and Shiller R., 2001) and debt relief for sovereigns; but in practice, rating the terms of Ukrainian sovereign debt restructuring in 2015 one has to pay attention to a 'Put Event', in case of which "the Issuer shall, at the option of a Holder … repurchase the Security held by such Holder on the relevant Put Date at a price equal to the Notional Amount of the Security" (See definition of "Put Event" in 'Exchange Offer Memorandum Dated 23 September 2015', p.66). Therefore, these specific creditor protection mechanisms, that were absent in other comparable securities (defined by Wilkinson (2015) as "a pure innovation in design of the Ukraine GDP-linked Securities") *transform Ukrainian GLW from risk-sharing derivative into direct claim on future wealth of the sovereign*.

Practicalities of designing GDP-linked securities start with the choice of an economic indicator, that the sovereign produces and revises, the options being GDP, rate of GDP growth and GDP per capita. It is generally acknowledged that the last index is the most problematic in usage, as it is sensitive to population statistics, the reliability of which is often questionable – contrary to GDP data, which are standardized, comparable across countries, concrete and regularly published (by countries themselves as well as by international organizations).

Additional stumbling block in choosing the index is a controversial question: whether to take into account the share of the shadow economy, not included in official statistics (and in case of positive answer – how to measure it). In Ukraine, for example, at the time of debt restructuring this share was valued by foreign experts (Shadow, 2018) up to 42.9% (the average for 158 countries being 27.78% – Shadow, 2015).

Up until recently one of the controversial issues was the determination of the data source. Importance of this issue is demonstrated by ongoing legal battles (between Argentinian government and US and British hedge funds – holders of GDP warrants), caused by the decision of Argentinian government to discontinue publishing of the Actual Real GDP in constant 1993 prices (metric agreed by the parties when issuing warrants) and to replace real GDP calculation effective 2014 in constant 2004 prices. Change of the source data has given the chance to Argentina to claim that its growth had not exceeded the trigger in 2013, while New York-based hedge fund Aurelius Capital claimed that it did and filed a lawsuit for alleged payment shortfall for more than $80 million. It is notable that in January 2020 senior U.S. District judge Loretta Preska decided in favor of Argentina, stating that "the relevant contractual terms clearly and plainly indicate that the calculations material to Aurelius's breach of contract claim must rely on enumerated economic metrics produced by the Argentinian government".

Drawing the moral of this experience creditors of Ukraine insisted on using data on GDP growth based on IMF's World Economic Outlook, thus enabling investors to monitor data through the IMF's annual observance reports and any assessments by IMF staff on data quality.

Another problem arising after choosing the index is selection of specific unit of measurement: in current or constant prices, in local or foreign currency units, using market and factor prices etc.

Importance of the choice is evident in terms of the Ukrainian GDP growth data: compared to the previous year GDP growth in 2016 in UAH by 20.4%, in USD the same growth at the same period was estimated at 2.9% (one seventh as much), in 2014 – in UAH – growth was 7.7%, while data in US currency demonstrated economic shrinking: minus 28.1%.

In dealing with this issue Missale and Bacchiocchi (2012) proposed, that the choice of using nominal or real GDP values when issuing VRR should be determined by the currency in which these securities are denominated. They reasonably asserted that, if the loans were denominated in key foreign currencies, then a linkage to real GDP in local currency units is needed to prevent the issuing country from the double-charge of balancing the inflation rate and paying for an associated depreciation of the local currency. At the other end of the scale, if the loans were denominated in local currencies, they should be linked to nominal GDP (in local currency units) for two reasons (i) linkage to nominal GDP would provide insurance to the borrower against unexpected deflation and thus help to stabilize the debt-to-GDP ratio; (ii) nominal indexation would remove inflationary temptations and offer some

protection to the lender against a depreciation of the exchange rate.

In view of the foregoing both versions of the Indicative Term Sheet (2015 and 2016), developed by the ad hoc working group on GDP-linked bonds, reason that in issuing such bonds '*only domestic currency*' should be used. Theoretical ground for this perceived risk transfer from the issuer to investor is the inverse correlation between nominal GDP in domestic currency and the exchange rate of local currency. Whereas currency depreciation boosts nominal GDP (both via its positive impulse on the cost of exports and/or via the increase in import prices), foreign holders of domestic currency GDP-linked securities have a natural hedge against currency losses.

Contrariwise, the choice of domestic currency is not optional when GDP-linked warrants are issued in the course of previous debt restructuring: the currency risk is always laid on sovereign debtors, which is justified by currency denomination of restructured credits (see 'Original sin' hypothesis); it is no wonder that Ukrainian GDP warrants were denominated in USD and EUR. But it is a truism that such denomination is fraught with higher vulnerability of debtor country in the event of adverse external shock.

Next important matter of argument to be addressed while designing GDP-linked securities is their time to run.

When speaking about bonds, Robert Shiller and Mark Kamstra advocated a concept of a perpetual GDP-linked bond, setting the time to maturity to infinity (Sovereign GDP-Linked, **2018, p.8)**. On the issue of warrants senior economist at the Bank of England Mark Joy, as well as the majority of experts, advocates a long-term maturity, i.e. a lifespan of 10 to 20 years, enough to span more than one business cycle; the longer the maturity, the better the hedge the GDP-linked bond provides against lower trend growth (Sovereign GDP-Linked, 2018, **p.55)**.

Indicative term sheet (The London Term Sheet) tender an offer of the sufficiently long tern to provide for a smoothing of payments over a number of economic cycles, for example 10 or more years. Ukrainian GDP-linked warrants were scheduled in 2015 to be valid *unprecedentedly long* 25 years – till 2040.

Closely connected with the problem of maturity is an issue of timeframe of payments – i.e. the time lag between the end of the year and payments for that year. Technically the need of such period is necessitated by rather a long period, needed for the compilation and publishing the data. In many countries it takes not less than three months, and after that a lot of times GDP was revised in many countries, even years later.

Data revisions are of two types: regular, periodic changes that result from the inclusion of more accurate information and infrequent fundamental changes in methodology. The first of these results from the late arrival of useful data (like information from tax authorities, census surveys, and the like). The example of the second type is provided by **Stephen Cecchetti and Kim Schoenholtzor** (2017): in 2013, the US Bureau of Economic Affairs altered the classification of research and development in its comprehensive revision of the US national income and product accounts. Formerly treated as intermediate inputs and hence ignored, they were reclassified as investment, which is a final good. This adjustment raised the level of GDP on average by about 3.2%. At the time, Treasury debt held by private investors totalled $9.964.5 billion, or 62% of GDP. If this had all been in the form of GDP-principal-indexed bonds, the value of government debt would have jumped by $325 billion.

As specified by Mark Joy (2018), for both the issuer and the investor there is a trade-off over the optimal length of the indexation lag. If the lag is too short, it is likely that the early estimates of GDP that bond payments are linked to will have to be revised when better data comes along. Meanwhile if the lag is too long, then payments may turn out to be indexed to previously high levels of GDP, when in fact the economy has already turned downwards, but the payment schedule demands large payouts in the following years.

This theoretical argument can be pictured by the data on Argentina (Ukraine's predecessor as an issuer of GDP-linked warrants) GDP growth rate: extreme volatility of this index provides for sizable payments during the period of GDP plunge (see Fig. 1), when diminished government's tax receipts makes servicing of sovereign debt almost unaffordable.

For Ukraine postponement of payment is scheduled for 2 years – it can be considered as advantage for Ukraine, as well as a disadvantage: the latter characteristic can be demonstrated by high payments that would be driven by good GDP data in 2019, but have to be disbursed in 2021 – after Covid-19 pandemic and anticipated economic collapse caused by it.

Alongside with applied points of VRR design academicians are preoccupied with the problem of GDP-linked securities pricing. Numerous articles published over the course of last decades focused on the pricing of GDP-linked products, although with a different methodological approach. Some of them used fundamental valuation dividend-discounting method, others – Black-Scholes type pricing model or CAMP; there are papers based on a Brownian motion for the GDP and Monte Carlo simulations on foreign currency – all of the authors searching the best way to determine the insurance premium that investors might demand to cover the risk of weak growth prospects. Nicolas Carnot and Stéphanie Pamies Sumner (2017) presented their vision of the components (sub-premiums) of this premium – namely the raised interest for GDP-linked bonds. According to them such sub-premiums should be a liquidity premium, given the narrow size of the GLBs market in its early stage of development; a novelty premium, reflecting the new/unfamiliar nature of the investment product; a growth risk (or indexation) premium, compensating investors for taking on

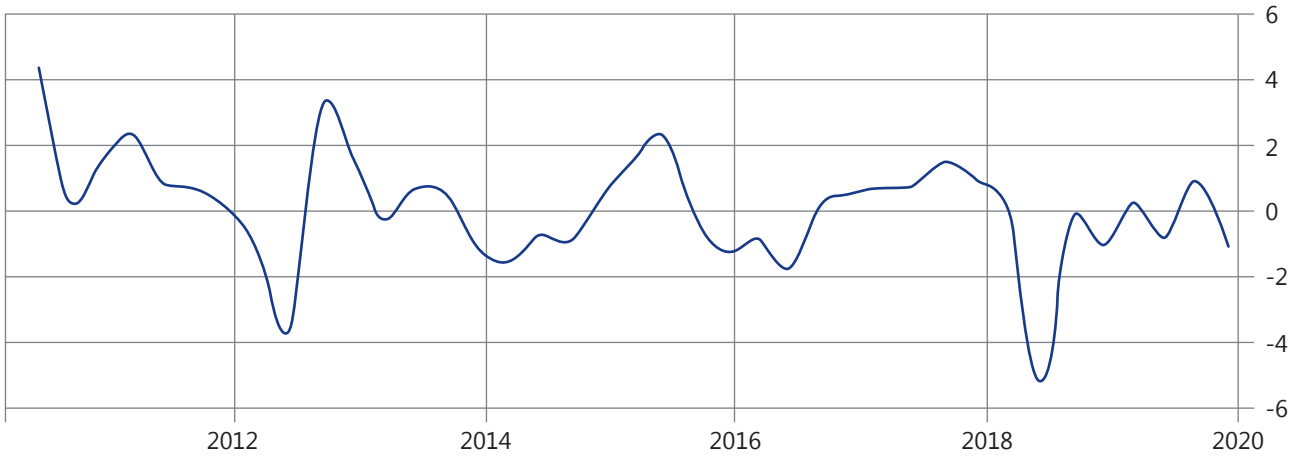

Fig. 1. Argentina GDP Growth Rate.

Source: Argentina GDP Growth Rate. 2020

some of a country's economic growth risk; a default risk premium, which could actually play a mitigating role. In total different researches guesstimate this premium to be in the range of 35 to 370 basic points.

Proceeding from theory of GDP-linked bonds engineering to practice of issuing GDP-linked warrants, it is interesting to compare theoretical findings with the reality of Ukrainian debt restructuring in 2015. In theory, since the warrant is usually issued along with a debt issue of which the warrant is a part, the yield on the bond that has a warrant attached may be slightly lower than a similar bond that has no warrant attached (Janakiramanan S., 2014). In reality *the cost of servicing* of New Notes, issued in the process of Ukrainian debt restructuring, was *raised* from 7.22% to 7.75%.

The list of economic terms and conditions to be designed while issuing GDP-linked securities certainly must be enlarged by the dilemma of what to index: principal or coupon.

In academic literature there are two canonical models for a choice of a point of reference for GDP-linked securities: (i) Borensztein and Mauro version, linking only the coupon to the growth rate (with the principal remaining fixed – a "floater") and (ii) Shiller's version, which indexes both the coupon and the principal to the level of nominal GDP (the coupon on the bond being paid as a fixed proportion of this principal, also varies with nominal GDP); they are referred to by Robert Shiller as 'trills', and in academic papers – as 'principal-indexed'.

While issuing GDP-linked warrants there is no sense in choosing point of reference, as the warrants have no coupons; both variables are used as 'trigger' event.

Pursuant to IMF Working Paper How to Evaluate GDP-Linked Warrants: Price and Repayment Capacity (Miyajima, 2006), the ideal GLWs should be designed in such a way, that the trigger conditions were clearly identifiable and the payment amount easily calculated. Thus the trigger for the repayments should reflect (a) the actual real GDP levels exceeding the potential levels determined upon issuance, and (b) the actual growth rates of real GDP exceeding predetermined level. Condition (a) ensures that a country recovering from a severe GDP contraction by growing above potential will not pay on the warrants until the actual GDP level has finally recovered and exceeded its long-term potential trend.

Quantification of trigger conditions is the subject-matter of the talks on restructuring. Whereas the creditors are motivated to fix the lowest threshold (to arrange future payments), debtor countries aim at higher figures. In 2015 under the terms of Ukrainian sovereign debt restructuring the *threshold was fixed at the extremely low level* of $125 billion: during preceding the deal seven years GDP of Ukraine was below this threshold only once – in 2009 ($117.08 billion), while in the last prewar year (2013) it exceeded $175 billion (GDP of Ukraine, 2020).

Three more specific for Ukraine features are the following:

I. High level of its economy dependence on external factors: being an export-oriented country Ukraine's GDP is affected both by the prices of world market and currency exchange rate (which for the last year was influenced mostly by non-residents trading in Ukrainian T-bills).

II. Unavailability of any cap for repayments: while the cap for Argentinian securities has been set at 48% of their value (limiting possible maximum payable amount on these securities at $29.8 billion), and Greek GDP-linked warrants had an annual payment cap of 1% of their notional amount, Ukrainian VRR are not limited by the notional amount of the warrants and have no cap at all for the last 15 years (starting from 2026 till 2040).

III. Extremely high portion of GDP growth increment to be paid to war-

rant holders: while Argentina was required to pay 5% of its GDP excess, and each annual payment on Greece VRR could not exceed 1% of their notional value, Ukraine is required to pay 40% of the growth beyond 4%.

As a result, possible total amount of payments on warrants varies with the expected rates of growth and experts' expectations. The highest figure, according to calculations of professional employee of Investment Capital Ukraine LLC is $76.78 billion in scenario of stable growth of 7% (Kotovych, 2015); according to calculation of Ivan Bohdan and Anastasiia Sviridovska (2019), highest figure will exceed $82 billion (in case of 5.7% growth). Estimates of Ukrainian Treasure Minister Sergiy Marchenko are more optimistic: only $22 billion (Payments, 2020).

Premised on these assessments and keeping in mind notional value of warrants ($3.6 billion) it is tough to swallow definition of this deal by Valeria Gontareva (then Chairwoman of National Bank of Ukraine and active participant of the negotiations on restructuration) as "successful restructuring" (Gontareva, 2020)

Conclusions

1. GDP-linked warrants in many cases appeared to be extremely profitable investments. As an example Juan Cruces and Tim Samples (2016) compared the ex-post returns of one dollar invested in 2005 in different securities (given that all interim cash-flows – dividends or coupons – paid by each holding were reinvested in that same security). They have found "astronomical returns" on Argentina's GDP-linked warrants, having calculated that in 2015 total return would be: on US 10-year Treasuries – $1.68, on Apple – $12.89, on Argentina exchange bonds in USD-EUR – $3.38, and on Argentina GDP warrants in USD-EUR – $16.17. As for Ukrainian GDP-linked warrants, Ukraine reputedly has to pay only during 2021–2024 19.1 billion hryvnias.

Such cost advantages of GDP-linked warrants are hardly surprising, considering the fact that they are usually issued at a time when the issuer is deep into economic shock, on the verge of default and debtor's bargaining power is next to nothing.

2. Comparing theoretical and practical issues of VRR emission it is important to focus attention on the problem of 'moral hazard'. Almost all the experts, quoted in this paper name 'moral hazard' as one of the main factors, standing in the way of widespread emission and circulation of GDP-linked warrants/bonds. They mention only one aspect of this problem: according to UNDP experts, "the contractual arrangements underlying GDP-linked securities can in theory create incentives for debt issuing countries to pursue growth reducing or, at least, growth dampening, policies, as a way of limiting GDP-linked interest payments on their debt" (Warren-Rodriguez, 2015), thus causing a 'moral hazard problems'. But, as experience gained while negotiating Ukrainian VRR has proven, there is another aspect of this problem, no less important: politicians and public officers of the majority of indebted countries (especially of those, whose sovereign debts need restructuring) tend to have relatively short time horizons; for them short-term profit maximizing (temporary exemption of payments) decisions are most wished for, irrespective of the threat of feasible future losses. In the long run such undue over-compromising policy is fraught with incommensurable losses for debtor countries.

Awareness of the fact, that such losses are more than likely to happen has already compelled current Ukrainian policymakers to assume preventive measures: in August 2020 10% of outstanding GDP-linked warrants (UKRAIN'40) were repurchased by Ukraine on the Irish Stock Exchange.

Abovementioned facts validate reasonableness of Ivan Bohdan and Anastasiia Sviridovska (2019) conclusion of the necessity of (I) reforming the decision-making process within a public finance system and (II) increasing the responsibility of civil servants to prevent damage to the country. By analogy with the Ukrainian law on parliamentary control over the privatization of state property it would be reasonable, to our opinion, to introduce legislation on parliamentary control over external borrowings.

3. One more aspect of 'moral hazard' problem is related to insatiability of creditors. Their successful efforts to take advantage of financially and economically beleaguered sovereigns can in future lead to the defolt of the emitent of GDP-linked warrants, thus endangering repayments to other crditors. That is why the requisition of other creditors and/or International Monetary Fund monitoring of such restructuring talks and having their say seems reasonable.

References

1. Argentina GDP Growth Rate. Official site of the online platform Trading Economics. Retrieved on June 5 2020 Available at: Argentina GDP Growth Rate | 1993–2019 Data | 2020–2022 Forecast | Calendar. Retrieved 18.06.2020
2. Athanasoulis, Stefano G., and Shiller Robert J., 2001, "World Income Components: Measuring and Exploiting Risk-Sharing Opportunities," American Economic Review, Vol. 91, No. 4, pp. 1031–54.
3. Bank of England workshop on GDP linked bonds. Bank of England, London, Monday 30 November 2015. Available at: https://www.bankofengland.co.uk/events/2015/november/bank-of-england-workshop-on-gdp-linked-bonds .
4. Bohdan I, and Sviridovska A. RESTRUCTURING OF EXTERNAL PUBLIC DEBT IN 2015 AND ITS CONSEQUENCES FOR THE FISCAL SPACE IN UKRAINE. "Фінанси України", N 7, 2019 p.64.
5. Borensztein, E., Mauro, P. Reviving the Case for GDP-Indexed Bonds. September 1, 2002. Available at: https://www.imf.org/en/Publications/IMF-Policy-Discussion-Papers/Issues/2016/12/30/Reviving-the-Case-for-GDP-Indexed-Bonds-16054. Retrieved 18.06.2020
6. Borensztein,E, Obstfeld, M and Ostry, J. Overcoming the obstacles to adoption of GDP-linked debt. In Sovereign GDP-Linked Bonds: Rationale and Design. Edited by James Benford, Jonathan Ostry and Robert Shiller. CEPR Press, London. 2018.

7. Campos, R. Argentina prevails vs hedge fund in GDP-linked securities lawsuit. Business News, January 8, 2020. Available at: Argentina prevails vs hedge fund in GDP-linked securities lawsuit – Reuters. Retrieved 18.06.202 °Carnot, N. and Sumner S. GDP-linked Bonds: Some Simulations on EU Countries. DISCUSSION PAPER 073 | DECEMBER 2017. Available at: https://ec.europa.eu/info/sites/info/files/economy-finance/dp073_en.pdf. Retrieved 18.06.202 °Cecchetti, S., Schoenholtz K. GDP-linked bonds: A primer VOX CEPR Policy Portal. 01 March 2017. Available at: https://voxeu.org/article/gdp-linked-bonds-primer. Retrieved 18.06.202 °Cruces, J., and Samples T. "Settling Sovereign Debt's 'Trial of the Century'", Emory International Law Review. Vo.31, 2016. P. 29.
8. 'Exchange Offer Memorandum Dated 23 September 2015', Invitation by. Ukraine. Available at: http://fs.ux.com.ua/f/2145/memorandum.PDF. Retrieved 18.06.2020
9. Farley, A. Warrants: A Risky but High-Return Investment Tool. Investopedia. Available at: https://www.investopedia.com/trading/warrants-risky-but-high-return-investment-tool/. Retrieved 18.06.2020
10. Furio, E. Warrants: What are they and how do they work? Official site of the BBVA. Available at: https://www.bbva.com/en/warrants-what-are-they-and-how-do-they-work/ . Retrieved 18.06.2020
11. Gontareva, V. Mission Possible: The True Story of Ukraine's Comprehensive Banking Reform and Practical Manual for Other Nations. London, 2020, pp.20–21.
12. Griffith-Jones, S. and Sharma, K. GDP-Indexed Bonds: Making It Happen DESA Working Paper No. 21. ST/ESA/2006/DWP/21 April 2006. Available at: https://digitallibrary.un.org/record/573925?ln=en. Retrieved 18.06.2020
13. Gross Domestic Product of Ukraine. Official site of the Ministry of Finance of Ukraine. 2020. Available at: https://index.minfin.com.ua/ua/economy/gdp/. Retrieved 18.06.2020
14. Hogg, R. Ukraine lays the golden egg for Bank of America. IFR 11 January 2020. Available at: https://www.ifre.com/story/2200370/ukraine-lays-the-golden-egg-for-bank-of-america-l8n29d5np. Retrieved 18.06.2020
15. Janakiramanan, S. Derivatives and Risk Management. Pearson Education India, 2014. p.231.
16. Joy, M. Sovereign GDP-linked bonds: Design choices. In Sovereign GDP-Linked Bonds: Rationale and Design. Edited by James Benford, Jonathan Ostry and Robert Shiller. CEPR Press, London. 2018.
17. Kopf, C. GDP-linked securities: Designing instruments for a new asset class. In Sovereign GDP-Linked Bonds: Rationale and Design. Edited by James Benford, Jonathan Ostry and Robert Shiller. CEPR Press, London. 2018.
18. Kotovych, T. Bond Market Insight. Debt restructuring: Ukrainian version. ICU, December 8, 2015. Available at: www.icu.ua › download › ICUDebtInsight-20150710. Retrieved 18.06.2020
19. Missale A. and Bacchiocchi E. Multilateral indexed loans and debt sustainability. Oxford Review of Economic Policy 31(3–4) · January 2012. Available at: https://www.researchgate.net/publication/270574861_Multilateral_indexed_loans_and_debt_sustainability. Retrieved 18.06.2020
20. Miyajima, K. How to Evaluate GDP-Linked Warrants: Price and Repayment Capacity IMF Working Paper. March 2006.
21. Park, S., Samples, T. Ukraine's quietly revolutionary debt restructuring. Financial Times, September 17 2015. Available at: https://www.ft.com/content/d7656d33–874f-30bf-b78e-3aa7b9d229e8. Retrieved 18.06.2020
22. Payments on GDP warrants of $40 mln in 2021 with moderate GDP growth potentially could reach $22 bln by 2040 – Finance Minister. Interfax-Ukraine, September 9, 2020 Available at: https://en.interfax.com.ua/news/economic/686624.html.
23. Sachs, J. D. "Conditionality, Debt Relief, and the Developing Country Debt Crisis," NBER Chapters, in: Developing Country Debt and Economic Performance, Volume 1. 1989. Available at: https://ideas.repec.org/b/nbr/nberbk/sach89–1.html. Retrieved 18.06.2020
24. Shadow economy – Country rankings. Official site TheGlobalEconomy.com. Available at: https://www.theglobaleconomy.com/rankings/shadow_economy/.
25. Shiller, R.J. (1993). Macro Markets: Creating Institutions for Managing Society's Largest Economic Risks. Oxford UniversityPress. 1993.
26. Shiller, R. How economies could insure themselves against the bad times. The Guardian 19 March 2018. Available at: https://www.theguardian.com/business/2018/mar/19/how-economies-could-insure-themselves-against-the-bad-times. Retrieved 18.06.2020
27. Sovereign GDP-Linked Bonds: Rationale and Design. Edited by James Benford, Jonathan Ostry and Robert Shiller. CEPR Press, London. 2018.
28. Stiglitz, J. The Stiglitz Report: Reforming the International Monetary and Financial Systems in the Wake of the Global Crisis. The New Press, New York, London. 2010.
29. Ukraine's GDP warrants hit par as the country's economic future brightens. By bne IntelliNews. January 14, 2020. Available at: https://www.intellinews.com/ukraine-s-gdp-warrants-hit-par-as-the-country-s-economic-future-brightens-174552/. Retrieved 18.06.2020
30. Warren-Rodriguez, A. and Conceição, P. Risk-Informed Finance for Developmen. Can GDP-linked official lending to emerging economies and
31. developing countries enhance risk management and resilience? UNDP Discussion Paper. .July 2015. Available at: https://ideas.repec.org/p/ess/wpaper/id7147.html.
32. Wilkinson, A, .Wood, A. Ukraine's Sovereign Restructuring: Why is this sovereign deal ground-breaking? Weil. Nov 12, 2015. Available at: https://business-finance-restructuring.weil.com/international/ukraines-sovereign-restructuring-why-is-this-sovereign-deal-ground-breaking/. Retrieved 18.06.2020
33. Williamson, J. Curbing The Boom-Bust Cycle: Stabilizing Capital Flows to Emerging Markets. Washiington, Institute for International Economics. 2005. Available at: http://cup.columbia.edu/book/curbing-the-boom-bust-cycle/9780881323306. Retrieved 18.06.2020

Амалян А. В., Амалян Н. Д.

ОВДП: теорія та практика

Стаття містить огляд теоретичних та практичних аспектів викидів гарантований цінних паперів, пов'язаних з ВВП. Теоретичні проблеми досліджуються через порівняння оригінальних облігацій, пов'язаних з ВВП, та ордерів, пов'язаних з ВВП, виданих під час реструктуризації боргу; практичні аспекти розглядаються за допомогою порівняльного огляду термінів та умов останніх випусків таких фінансових інструментів Аргентиною, Грецією та Україною. Внутрішні розбіжності між теорією та практикою у поєднанні з виявленими тенденціями до посилення строків та умов кожної послідовної емісії дозволяють зробити висновок щодо раціоналізації потреби національного та міжнародного моніторингу переговорів про реструктуризацію зовнішнього боргу.

Ключові слова: ОВДП, моральний ризик, Україна, переговори про реструктуризацію боргу, моніторинг.