

# TREASURY DIRECT - A COMPARISON BETWEEN THE PROGRAM FOR SALE OF PUBLIC SECURITIES TO INDIVIDUALS THROUGH THE INTERNET, IN BRAZIL AND THE UNITED STATES. 

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## 1. INTRODUCTION

The Treasury Direct is a program implemented by the Department of the Treasury, that allows individuals to purchase public bonds through the internet. There are only three countries that have implemented this kind of purchasing of public bonds Brazil: Spain and United States.

The program aims at democratizing investments in federal bonds, giving more liquidity to the secondary market, stimulating long-term savings, and providing information regarding the management, structure and the transparency of the federal public debt.

This paper will focus in the advantages of purchasing public bonds through the internet, how it makes the access of the public easier, how the countries that have this kind of program become more efficient in control their public debt and the different characteristics of the public bonds issued through the internet. And also it will show the enormous advantages that a country has when they don`t need to issue paper bonds, and how the governments can draw the public debt choosing what kind of public bonds they will issue, as linked inflation bonds, fixed rate bonds or savings bonds.

### 1.1 HOW THE TREASURY DIRECT WORKS IN BRAZIL

The National Treasury of Brazil, with the support of the Brazilian Custody and Settlement Company - CBLC, implemented the Treasury Direct program in January of 2002.

The program allows any individual with at least $\mathrm{R} \$ 200.00$ ( two hundred reais) and an account in a financial institution to purchase bonds. The Treasury Direct is a kind of program ensured by the National Treasury, with high profitability and competitive cost allowing the investor to manage your own public bonds portfolio instead of being dependent on investments funds.

The Treasury Direct system is secure and easy to operate, what permits the investor to finish all their transactions in any time of the day through the internet. In order to provide liquidity to the bonds purchased through the system, the National Treasury performs weekly repurchases. There is no time limit regarding the resale of bonds back to the Treasury Direct, nor is there a limit to the repurchased value. The bonds are repurchased at the market price quoted on the date of the transaction.

The maximum limit per investor is $\mathrm{R} \$ 400,000.00$ per month, but there are no limits to public bonds holdings, the investor can purchase R\$400,000.00 of public bonds every month. Those months the interest is paid and the bonds are purchased through the Treasury Direct, the value redeemed or paid in interest is added to the monthly limit.

The purchase and sale of bonds through the Treasury Direct system may be made twenty hours a day on working days and twenty four hours a day on weekends and holidays. Between five and nine am on working days, activity on the Treasury Direct is suspended for system updating and maintenance. Balance and limit statements may be issued twenty four hours a day. However, the National Treasury may suspend the activities of the Treasury Direct at any time, as deemed necessary.

The public bond sale portal has two types of access: public and restricted. The general public may access information regarding registration, sales, purchases, public debt indicators, legislation, system security, as well as other types of information. Access is restricted once the username and password have been entered, allowing the investor to perform purchase and sale operations, as well as monitor account activity.

### 1.2 HOW THE TREASURY DIRECT WORKS IN THE UNITED STATES

The TreasuryDirect of United States started in October of 2002, it allows individuals to purchase the full range of Treasury consumer securities in one convenient online account. If the individual has a TreasuryDirect account, he can purchase and hold Bills, Notes, Bonds, Treasury Inflation-Protected Securities (TIPS), and savings bonds. Treasury Direct is the primary retail system for selling public securities. In United States the investor can purchase securities twenty
four hours a day, every day, through the Treasury Direct service and also there is a phone number that the investor can call any time.

The investor has to open an account in the U.S. Treasury, by filling a form that is available in the Internet and send it to one of the four agencies of the TreasuryDirect. After the account is confirmed, the system enables the investor to do business with the U.S. Treasury electronically using the Internet and conduct transactions without personal assistance from the Treasury.

The minimum that a individual can purchase is US\$ 100.00 and the maximum is US\$ 5 million for noncompetitive biddings. All the investments have to be multiples of US\$ 100.00. The investor can purchase electronic bonds through a Treasury Direct account, but he cannot purchase paper bonds online.

### 1.3 BRAZIL - ADVANTAGES OF PURCHASE PUBLIC BONDS THROUGH THE INTERNET

There are many advantages of allowing individuals to purchase public bonds through the internet. It facilitates easier access of the population to the public bonds, it is a new and safe way of saving money, the investor can manage his own portfolio, it is a competitive investment, it is very easy to operate and the liquidity of the bonds is warranted by National Treasury. When an individual is able to buy public bonds through the internet, the secondary market is demystified, everyone can access subjects that were only for specialists of the financial market, and it helps the National Treasury to reduce his cost once that
gives more liquidity to the investors. The Treasury Direct encourages formation of long-term savings among small-scale investors and providing information on Brazilian Federal Public Debt.

### 1.3.1 MAIN OBJECTIVES TO REDUCE RISKS OF INVESTING IN PUBLIC BONDS

The main Federal Public Debt management objective is to minimize longterm financing costs, ensuring the maintenance of prudent risk levels, and contributing to the proper running of the market for the public debt.

In order to achieve these goals, the following general guidelines for the DPF (Federal Public Debt) management have been established:

- Lengthening of the DPF average maturity, mainly by increasing the average term of bonds issued in public offerings (auctions);
- Reduction of the debt share due in 12 months;
- Gradual replacement of floating-rate (Selic-linked) bonds, as well as of exchange-linked bonds, by fixed-rate and inflation-linked bonds;
- Incentives to the development of the term structure of interest rates for federal public securities on domestic and external markets;
- Expansion of the investor base.

So the fixed rates bonds together with the inflation linked bonds are consolidated as the main DPF financing instruments reducing in $15 \%$ of GDP its market risks in stress situations. This higher protection to external shocks allows the National Treasury to change the adjustment pace of the DPF profile.

The National Treasury will also continue its ongoing dialogue with the various financial market segments, while taking other measures aimed at expanding the investor base and ensuring a more adequate supply of public securities.

In order to reduce the concentration of maturities, the National Treasury will continue the early redemptions of short-term securities, together with exchanges of short-term securities for longer-term bonds. Aside from this, early redemption operations involving medium and long-term securities will continue.

| Index | Participation in the DPF total (\%) |  | Stress impact (R\$ billion) |  |
| :--- | ---: | ---: | ---: | ---: |
|  | 2003 | 2007 | 2003 | 2007 |
| Floating Rate | 46.5 | 30.7 | 72.39 | 47.75 |
| Exchange <br> Rate | 32.4 | 8.2 | 256.2 | 64.95 |
| Total | 78.9 | 38.9 | 328.6 | 112.7 |

Source: National Treasury
The table above shows the risk evolution of an increase in DPF stock in situations of strong and persistent turbulences, associated exclusively with changes in debt composition. Stress means a shock of three standard deviations over the average of the real floating rate (SELIC) and of the real exchange rate devaluation accumulated in 12 months, applied over the stock and composition of the DPF. The stress scenario is applied for a one year-period on the floating rate (SELIC) debt and, instantaneously, for the correction of the exchange rate debt.

According to all objectives described above the investor of Treasury Direct can feel safe to invest in public bonds through the internet.

### 1.4 UNITED STATES - ADVANTAGES OF PURCHASE PUBLIC SECURITIES THROUGH THE INTERNET

The individual that operates through the Treasury Direct can buy, manage, and redeem Treasury securities online, all from the convenience of their home or work, wherever he has secure internet access. He can establish multiple registrations in one account, can schedule recurring purchases for up to five years in advance. Saving bonds purchased through Treasury Direct are generally added to the account in just one business day. When the funds are needed, after the minimum term of ownership has been reached, the individual can cash part or all of a savings bond or bonds, directing the money to a checking or savings account at his bank or credit union. Since the securities are electronic, there is no paper to lose. The individual can even set up accounts for his minor children, as well as custom accounts for specific purposes such as a vacation and education. Treasury Direct provides a summary of account activity, including recent purchases, payments, and account balance. Besides the Treasury of United States is continually evaluating the efficiency and cost-effectiveness of its investment programs and realized that issuing savings bonds in paper form has become increasingly expensive over the years. By eliminating many of the processing costs associated with paper bonds, the Treasury is able to minimize the cost of the savings bonds program, and therefore, to taxpayers.

Technological advances now allow the Treasury to offer the same savings bond products at the same interest rates in electronic form through TreasuryDirect.

## 2 BONDS AVAILABLE FOR PURCHASE IN BRAZIL AND THEIR CHARACTERISTICS

### 2.1 NATIONAL TREASURY BILLS - LTN

Bonds which yields are determined (fixed rate) upon purchase. Form of payment: upon maturity. It is a short-term (the maximum term is about 24 months), zero-coupon fixed rate. The face value on maturity is $R \$ 1,000$.
2.1.1 Formulae used for calculating LTN prices and quotations:

PRICE ? $\frac{1,000.00}{? 1 ? y \operatorname{tm} ? \frac{b d}{252}} ;$ truncate at the 6 th decimal place
where:
ytm = yield to maturity (standard BD/252\% p.a. =>truncate to the $4^{\mathrm{TM}}$ decimal place)
bd = number of business days between settlement data (inclusive) and maturity date (exclusive);

### 2.2 NATIONAL TREASURY NOTES - F series - NTN-F

Bonds with fixed rate yields, along with interest defined upon purchase. Form of payment: every six months(interest) and upon maturity ( principal). It is a long
term ( the maximum term is about 10 years) fixed rate coupon bonds. The face value on maturity is $R \$ 1,000.00$.

### 2.2.1 Formulae used for calculating NTN-F prices and quotations:

Price $=$
? $1000 ? \stackrel{?}{\stackrel{?}{?}\left(1.10^{0.5} ? 1\right)} \stackrel{?}{?} ?$
Note the numerator of each term should be rounded to five decimal places.

### 2.3 TREASURY FINANCIAL BILLS - LFT

Bonds which daily yields are linked to the economy's basic interest rate (average rate of daily operations with public bonds registered in the SELIC system, or simply, the SELIC rate). Form of payment: upon maturity. It is floating rate, zero coupon bills, and the maximum term is about 5 years.

### 2.3.1 Formulae used for calculating LFT prices and quotations:

- Quotation Calculation

QUOTATION ? $\frac{100}{? 1 ? \text { discountorpremiumrate? ? }{ }^{\text {bd }} \text { ? }}$; truncate to the $4^{T M}$ decimal place
where:
discount or premium rate: standard $B D / 252 \%$ p.a. $=>$ truncate to the $4^{\mathrm{TM}}$ decimal place;
bd = number of business days between settlement date (inclusive) an maturity date (exclusive);

- Price Calculation

Price $=\frac{\text { Quotation }}{100} *$ projectedUNV; truncate to the $6^{T M}$ decimal place
where:

Projected UNV = up to date nominal value up to settlement date

### 2.4 NATIONAL TREASURY NOTES - B series NTN-B

Bonds which yields are linked to the variation of the Consumer Price Index IPCA, along with the interest defined upon purchase. Form of payment is every six month (interest) and upon maturity (principal). Its is an inflation linked coupon bonds, and the maximum term is about 40 years.

### 2.4.1 Formulae used for calculating NTN-B price and quotation:

- Quotation calculation


Note: the numerator of each term should be rounded to six decimal places and the final result for each term with a further ten decimal places.

Ytm - yield to maturity (standard BD/252\% p.a. => truncate to the $4^{\text {TM }}$ decimal place);
$\mathrm{Bd}=$ number of business days between settlement date (inclusive) and maturity date (exclusive).

- Price calculation

Price $=\frac{\text { quotation }}{100} *$ projectedUNV ; truncate to the $6^{\mathrm{TM}}$ decimal place
where:

Projected UNV = up to date nominal value (inflation index - accumulated IPCA since the reference date of $07 / 15 / 00$ to settlement date) projected to the settlement date.

### 2.5 NATIONAL TREASURY NOTES - C Series - NTN-C

Bonds which yields are linked to variation of the General Price Index - IGP-M, along with interest defined upon purchase. Form of payment: every six months (interest) and upon maturity principal. It is an inflation linked coupon bonds and the maximum term is about 25 years. The individuals cannot purchase this kind of notes anymore, because they are not offered in auctions, but the Treasury is still repurchasing them in the weekly repurchases.

### 2.5.1 Formulae for calculating NTN-C price and quotation:

- Quotation calculation


Note: the numerator of each term should be rounded to six decimal places and the final result for each term with a further ten decimal places.

Ytm - yield to maturity (standard BD/252\% p.a. => truncate to the $4^{\text {TM }}$ decimal place);

Bd = number of business days between settlement date (inclusive) and maturity date (exclusive).

- Price calculation

Price $=\frac{\text { quotation }}{100} *$ projectedUNV $;$ truncate to the $6^{\text {TM }}$ decimal place
where:

Projected UNV = up to date nominal value (inflation index - accumulated IPCA since the reference date of $07 / 01 / 00$ to settlement date) projected to the settlement date.

## 3 SECURITIES AVAILABLE FOR PURCHASE IN UNITED STATES AND THEIR CHARACTERISTICS <br> 3.1 TREASURY BILLS

Bills that are offered in multiples of $\$ 100$ and in terms ranging from a few days to 26 weeks. In the Treasury Direct system the 4 -week, 13 -week, and 26 week bills are available. Bills are sold at a discount from their face value. The price of a bill is determined at auction. The individuals can hold a bill until it matures or sell it before it matures. If the individual holds a bill until it matures, he can redeem the bill or use its principal to buy another security. The difference between what the individual pay for a Treasury Bill and the amount that the Treasury pay for an individual at maturity is interest. This interest is exempt from state and local income taxes.

### 3.2 TREASURY NOTES

Notes are offered in multiples of $\$ 100$ and are issued in terms of 2, 5, and 10 years. The price and interest rate of a Note are determined at auction. The price may be greater than, less than, or equal to the Note's par amount. The price of a fixed rate security depends on its yield to maturity and the interest rate. If the yield to maturity (YTM) is greater than the interest rate, the price will be less than par value; if the YTM is equal to the interest rate, the price will be equal to par;if the YTM is less than the interest rate, the price will be greater than par. The
investor can hold a Note until it matures, or sell it before it matures. If the investor doesn't sell it he can redeem the Note or use its principal to buy another security. Treasury notes pay interest every six months, this interest is exempt from state and local income taxes.

### 3.3 TREASURY INFLATION-PROTECTED SECURITIES - TIPS

TIPS are offered in multiples of $\$ 100$ and are issued in terms of 5,10 , and 20 years. They have their principal adjusted according to the Consumer Price Index. With a rise in the index, or inflation, the principal increases. With a fall in the index, or deflation, the principal decreases. TIPS pay interest every six months. The interest rate is a fixed rate determined at auction. Though the rate is fixed, interest payments vary because the rate is applied to the adjusted principal. Specifically, the amount of each interest payment is determined by multiplying the adjusted principal by on and a-half the interest rate. Treasury provides TIPS Inflation Index Ratios to allow the investor to easily calculate the change to principal resulting from changes in the Consumer Price Index. When TIPS mature, we pay either the adjusted principal or the original principal, whichever is greater. If the investor hold TIPS until they mature, at maturity the investor can use the TIPS principal to buy another security, or redeem the security. Interest payments from TIPS, and increases in the principal of TIPS, are subjected to federal tax, but exempt from state and local income taxes.

### 3.4 TREASURY BONDS

Bonds are issued in a term of 30 years and are offered in multiples of US\$ 100.00. The price and interest rate of a bond are determined at auction. The price may be greater than, less than, or equal to the bond's par amount (or face value). The price of a fixed rate secutity depends on its yield to maturity and the interest rate. If the yield to maturity (YTM) is greater than the interest rate, the price will be less than par value or a discount: if the YTM is equal to the interest rate, the price will be equal to par; if the YTM is less than the interest rate, the price will be greater than the par or a premium par. Bonds pay interest every six months. The investor can hold a bond until it matures or sell it before it matures. If he doesn't sell it , he can redeem the bond or use its principal to buy another security. The Treasury auctions Treasury bonds in february, may, august and november. The auctions in May and November are a reopening. In a reopening the Treasury sell an additional amount of a previously issued security. The reopened security has the same maturity date and interest rate as the original security. However, as compared to the original security, the reopened security has a different issue date and usually a different purchase price.

### 3.4.1 EE/ E Bonds

The rates and terms for an $E E / E$ bond are determined by when the bond was issued. EE/E bonds issued May 2005 and after earn a fixed rate of interest.

Rates for new issues are adjusted each May 1 and November 1, with each new rate effective for all bonds issued in the six months following the adjustment. Increase in value every month rather than every six months. Interest is compounded semiannually. Savings bonds must be held a minimum of one year, You can redeem them anytime after that time period. A three-month interest penalty will be applied to bonds held less than five years from issue date. This rewards longer-term bond holders who benefit from higher 5-year rates over the full life of the bond. At a minimum, the U.S. Treasury guarantees that an EE bond's value will double after 20 years, its original maturity, and it will continue to earn the fixed rate unless a new rate or rate structure is announced. If a bond doesn't double in value as the result of applying the fixed rate for 20 years, the U.S. Treasury will make a one-time adjustment at original maturity to make up the difference. Series EE bonds earn interest for 30 years. Interest earned on Series EE Bonds is exempt from state and local income taxes. The individual can defer federal income tax until redeem the bonds, or they stop earn interest after 30 years. The individual can redeem EE bonds when it is 12 months old.

### 3.4.2 I SAVINGS BONDS

I Bonds are a low-risk, liquid savings product. While the investor own them they earn interest and protect the investor from inflation. As a TreasuryDirect account holder, the individual can purchase, manage, and redeem I Bonds directly from his web browser. The investor can use I bonds to finance education, supplement
retirement income and give as a gift. The minimum purchase is US\$ 25 for a US\$ 25 I bond when purchase electronically via TreasuryDirect and the maximum purchase per calendar year is US\$ 5000.00 in TreasuryDirect. I bonds have an annual interest rate that reflects the combined effects of a fixed rate and a semiannual inflation rate. They are an accrual-type security. Interest is added to the bond monthly and is paid when the individual cash the bond. I bond are sold at face value. The miminum term of ownership is 1 year and the interest-earning period is 30 years. The penalties to a early redemption are forfeit 3 most recent months' interest if the individual redeem the bond before 5 years, and there is no penalty after 5 years.

The biggest difference between EE and I bonds is the rate that the individual receive on their bonds. Rates for EE Bonds are calculated as $90 \%$ of 6-month averages of 5-year Treasury Securities market yields, while rates for I bonds are calculated by combining fixed rates of return and semi-annual inflation rates based on the CPIU.

## 4. BRAZIL - THE ADVANCES OF TREASURY DIRECT PROGRAM

The Treasury Direct program completed six years of operation in January 2008, providing investors with the opportunity to obtain public bonds over the internet. In 2007, this program set a new record of 100,000 registered investors. Issuance through the Treasury Direct Program in December reached a volume of $\mathrm{R} \$ 45.5$ million. In this case, investor demand was focused on fixed rate securities, accounting for $51.03 \%$ of overall sales. Of this total, $34.50 \%$ referred to LTN and $16.52 \%$ to NTN-F. The participation of NTN-B closed at $34.02 \%$ and that of LFT at $14.95 \%$. The composition of the Treasury Direct has been changing since the program started. In December of 2004, the bonds that were sold were NTN-C and LTN; In December of 2007, the sales were concentrated mainly in LTN, follow by LFT, NTN-B and NTN-F. This is occurring because the Treasury is not offering NTN-C in his auctions and in Treasury Direct as well. Instead of NTN-C the Treasury is offering NTN-B as inflation linked bonds, that is growing in amount in relation with NTN-C, but the Treasury is still repurchasing them in the weekly repurchases.

Graph 4.1 - Treasury Direct Cumulative Sales


Source: National Treasury of Brazil

In relation to the number of investors, 2,415 new participants registered in the Treasury Direct Program in the month of December 2007. With these, total investors registered in the system since the program first got underway increased to 102,993 , representing growth of $40.70 \%$ in the last 12 months.

Graph 4.2-Treasury Direct - Registered Investors


## Source: National Treasury of Brazil

In relation to this achievement represents consolidation of the program which, after a rather modest beginning and with very little in advertising expenditures, has expanded steadily both in terms of the number of investors and the volume of sales. An important component in this process has been the importance that
the media has given to the program and the work developed by the National Treasury team.

## 5. UNITED STATES - THE ADVANCES OF TREASURY DIRECT PROGRAM

The TreasuryDirect in United States will complete six years in October 2008, and it is growing a lot. The system started with only Series I Saving Bonds available for purchase. Since then, the Treasury has added Series EE Savings bonds, along with marketable securities ( Treasury Bills, Notes, Bonds and TIPS). The individual may also convert paper savings bonds into electronic form to be held in a TreasuryDirect account.

Because the program was designed for investors who plan to hold their securities to maturity, it does not provide transfer services. Investors may, however, sell their securities for a fee through Sell Direct, a program operated by one of the Federal Reserve Banks. The graphic below shows the Debt held by the public that is all federal debt held by individual, corporations, state or local governments, foreign governments, Government Account Series Deposit Funds, and other entities outside the United States Government, less Federal financing Bank securities. Types of securities held by the public include, but are not limited to, Treasury Bills, Notes, Bonds, TIPS, United States Savings Bonds, State and Local Government Series securities, and Government Account Series Securities held by Deposit Funds. The amount sold in TreasuryDirect is included in this graph and has expanded since it was created.

Graph 5.1 - Debt Held by the public in million of dollars


Source: Bureau of the Public Debt

## 6. MAIN DIFFERENCES BETWEEN THE TREASURY DIRECT PROGRAM IN BRAZIL AND IN THE UNITED STATES

There are differences between the program in Brazil and United States, some of them are listed below, but the purpose of both programs is the same.

In Brazil, the individual needs to open an account in a Custody Agent to be allowed to manage their financial applications in Treasury Direct. After that the investor can purchase bonds directly through the internet. In the United States, the individual can open an online account directly in TreasuryDirect website with a social security number.

In Brazil the individual is allowed to purchase public bonds and hold them until it matures or sell them in the weekly repurchase. In United States the individual can purchase, reinvest and sell securities online. To sell a security before maturity, the individual has to $\log$ in his account and choose the sell direct function. The request is sent to the Federal Reserve Bank of Chicago which, acting on the Treasury department's behalf, will offer the security to different brokers and sell it to the highest bidder and for this sale the individual has to pay a fee of $\$ 45.00$ for each security sold. Similar to reinvestment, a repeat purchase allows the individual to use the funds from a maturing security to buy a new security.

In the United States, sometimes when the individual buys a security, he is charged accrued interest, which is the interest the security earned in the current interest period before he took possession of the security. If the individual is
charged accrued interest, the Treasury pays it back to the individual as part of his next semiannual interest payment. In Brazil, the payment of interest is done with the adjustment in the first period, when suitable. The first interest coupon to be paid will take into consideration the full rate established for six months, regardless of the security's date of issued.

The United States has a limit of the bonds that a individual can purchase. For example, the principal amount of definitive series EE savings bonds that may be purchased in the name of any person in any calendar year is limited to $\$ 5000.00$. In Brazil, the limit per investor is $R \$ 400,000.00$ per month but there are no limits to public bond holdings. In other words, investors may purchase the $R \$ 400,000.00$ limit every month.

The investor in Brazil has more aversion to risk, than the investor in United States, so the bonds in Brazil that are more purchased in Treasury Direct has a shorter maturity.

## 7.CONCLUSION

The National Treasury in Brazil will continue to broaden the Treasury Direct Program which, in its sixth year of existence, has over 100,000 registered investors. This achievement represents consolidation of the program which, after a rather modest beginning and with very little in advertising expenditures, has expanded steadily both in terms of the number of investors and the volume of sales. An important component in this process has been the importance that the media has given to the program and the work developed by the National Treasury team. Because of its important objectives and the significant results, showing its consolidation, the program will enter a new stage in 2008, when the National Treasury will make efforts to increase its distribution and disclosure, through a closer communication with financial agents and improvements in institutional publicity. The National Treasury has been investing in publicity and doing presentations in a lot of cities around Brazil to get the program known by small investors, and are constantly improving his webpage to make it more friendly to be operated by retail investors.

The Treasury Direct program of the United States is now fully implemented, enabling investors to establish accounts, purchase book-entry savings bonds and marketable securities, and manage their holdings online in a secure environment. The system validates their identity and process transactions electronically whenever possible. The communications occur via e-mail,
payments are made electronically and investors are able to access statements, confirmations, and tax information online. All these facilities show the success of the program in the USA. And most of all provide the possibility to finish with the issuing of paper bonds.

The Treasury Direct Program in both countries complete six years in 2008, and it has been reaching its objectives that are providing individual with the opportunity to obtain public bonds over the internet, making access to federal bond investments more democratic, and stimulating formation of long-term savings by retail investors.

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