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Assignment - 1
FEG904 - Fixed Income Securities
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Problem 1

In this question you will have to collect data from the Bank for International Settlements and the World Bank. Place the plots in the written file, and label them appropriately.

a. the BIS website, collect data on debt securities outstanding for the year 2000, 2005, 2010, 2015 and the most recent data (I already provided this data and slightly cleaned, so no need to collect it). Collect these data for the United States, Euro Zone, Japan, United Kingdom and China. https://www.bis.org/statistics/index.htm

b. From the World Bank, collect data on GDP for these countries for the respective years.

c. Plot the total size of debt securities for each of the years and countries and analyze the data (which are larger, what has happened over time, possible reasons, etc.)

d. Do the same, but as a percentage of GDP. What are the main differences? What does the size of the debt markets with respect to GDP tell us about these different markets?

e. Make a plot showing the make-up of the debt securities by financial companies, government and corporations. How has this changed? Can you explain why the different countries have different compositions in their debt markets? Is this as you expected?

Solution:

a. The organized data are attached in the attached excel file.

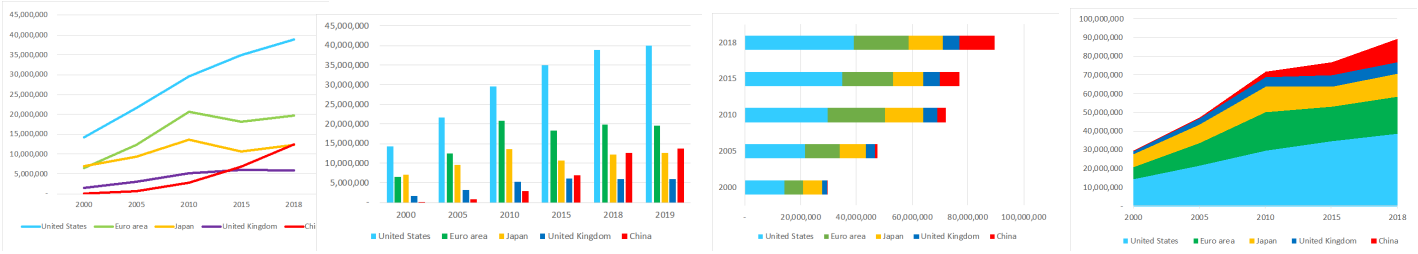
b. The data on GDP are shown in Table1 (from the World Bank: https://data.worldbank.org/).

Table 1: GDP (in trillion US dollars)

Year	China	United Kingdom	Japan	United States	Euro area
2000	1.21	1.66	4.89	10.25	6.48
2005	2.29	2.54	4.76	13.04	10.52
2010	6.09	2.48	5.70	14.99	12.63
2015	11.02	2.93	5.70	18.22	11.67
2018	13.61	2.86	4.97	20.54	13.65

c. As shown in the Figure 1 , the United States has the largest total size of the outstanding debt securities for the whole period from 2000 to 2018, followed by Euro zone. The figure for China was the smallest among the five economies' at the beginning of 20 century, while ending to be the third largest by 2018, having exceeded that for UK by 2015 and Japan by 2018. And we can notice that the figure for Euro zone and Japan is smaller for 2015 compared with that for 2010, while that for US, UK and China has been increasing for the whole period.

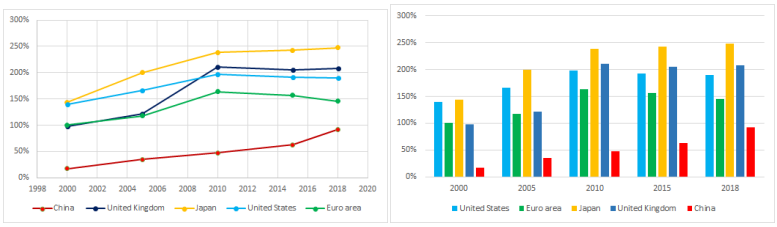
I suppose the suddenly decreased debt size for Japan Euro zone and Japan in 2015 can be explained by a sharp depreciation of the local currency against the US dollar, making the US dollar dominated size of debt securities shrunk a lot compared to that for 2010. And the data for exchange rates proves my estimation showing that US dollar has strengthened dramatically against all the world's other major currencies prior to 2015 (Gillespie, 2015).



(a) (b) (c) (d)

Figure 1: Total size of outstanding debt securities (in million US dollars)

d. Figure 2 shows that the size of the debt markets with respect to GDP is quite large for all the five economies. The sizes of total outstanding debt securities for UK and Japan have already exceeded two times of their GDP, while the figures for the united States and Euro zone are 208% and 145%, respectively. China has the smallest debt size as a percentage of GDP which is still increasing, implying that China's debt security market is still keep growing compared to other major economies. Also, the percentage for Japan is nearly 250% which is also the results from the sustained economic downturn in Japan since 1990s, despite the government's efforts to boost the economy using fiscal policies. Also, for all the economies we are concerned about here, the increased debt percentage to GDP in 2010 compared to 2005 can be partly explained by the 2008 financial crisis.

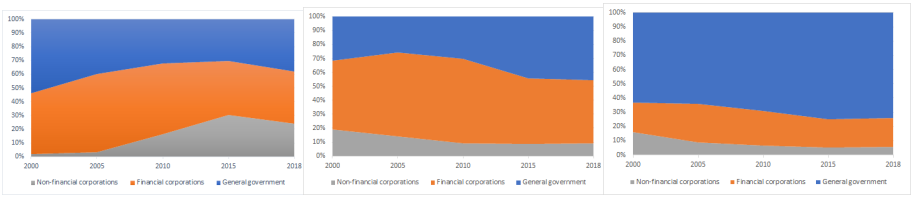


(a) (b)

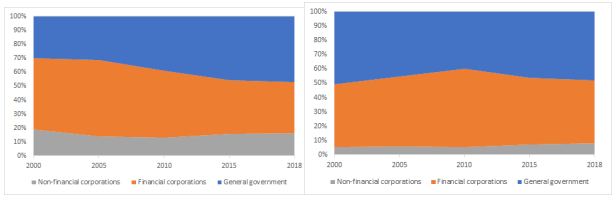
Figure 2: Total size of outstanding debt securities as a percentage of GDP

e. For china, the proportion of debt securities issued by non-financial company for China has increased from nearly zero to 20 percent. And the other two segments have about the same proportion during the period. The situations for Japan, United Kingdom and United States are relatively the same with a increased portion of government debt. And the composition of euro zone is almost unchanged in the past two decades.

I suppose that the highest percentage of government security for Japan is resulted from the government's fiscal stimulus initiatives to help reboot the stumbling economy (Pham, 2017). Also, to some extents, the compositions of debt markets for the other four economies are quite similar.



(a) China (b) United Kingdom (c) Japan



(d) United states (e) Euro zone

Figure 3: The make-up of the debt securities by government, financial companies government and non-financial corporations

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Problem 2

Debt ceiling:

a. Why is there a debt ceiling imposed by the U.S congress on the U.S Federal government?

b. Why would this be important for an investor in fixed-income assets?

Solution:

a. Constitutionally, Congress must authorize borrowing (Kowalcky and LeLoup, 1993). The debt limit was instituted in the early 20th century so the Treasury did not need to ask for permission each time it needed to issue bonds to pay bills. However, debt ceiling currently is regarded as a means to restrain the growth of debt (Wallach, 2017).

b. To some extent, the debt ceiling is the only thing potentially preventing the U.S. government from making its debt payments on time. Once the government hits the debt ceiling and exhausts all available extraordinary measures, it is no longer allowed to issue debt and will have at least temporarily default on many of its obligations.

At the same time, a default, or even the perceived threat of one, could have serious negative economic implications. Interest rates for treasuries would rise and demand for treasuries would drop if they are no longer considered as risk-free assets (Rappeport, 2017). If interest rates for Treasuries do increase substantially, interest rates across the economy would follow, which can greatly affect all the fixed-income securities.

Problem 3

Mortgages and Recourse (see the Moody's article for possible ideas):

a. What are the advantages of recourse on mortgages from the perspective of the lender?

b. Is it good or bad for borrowers? Why?

c. Analyze recourse from the perspective of systematic risk. How does recourse/no recourse affect systematic risk in an economy. Why?

d. Analyze recourse from the perspective of economic activity. For example, how does recourse affect a recovery after a recession? Will it make it faster or slower?

e. Your thoughts on recourse. For example, should it be applied in China or not?

Solution:

a. Recourse loans give lenders a higher degree of power because they have fewer limits on what assets lenders can claim against for loan repayment (Clark, 2020). From the lender's point of view, a recourse loan reduces the perceived risk associated with less creditworthy borrowers.

b. Recourse on mortgages could be seen as a double-edges sword for the borrowers. On the one hand, recourse loans might be more attractive to borrowers especially those who have poor credit, because of the relatively lower interest rates associated with the low risk nature of the recourse loans (Ghent and Kudlyak, 2011). On the other hand, recourse loans give lenders more rights to claim on borrowers' assets against for the loan repayments, which can be a real disadvantage from the perspective of the borrowers.

c. Recourse might increase the systematic risk of an economy. If all mortgages were recourse loans and borrowers had uncorrelated sources of income, their income streams would create an extra level of protection for lenders and, therefore, distribute the risk in the mortgage system between lenders and borrowers more evenly,decreasing the systematic risk of the economy (Khandani et al., 2013; Pavlov and Wachter, 2009).

d. Recourse may make a recovery slower after a recession. Mortgage recourse systems, by discouraging default, magnify the impact of nominal rigidities and cause deeper and more persistent recessions. Default mitigates liquidity traps because it redistributes wealth towards the borrowers with the highest marginal propensity to consume. This mechanism can account for up to 30% of the recovery gap during the Great Recession between the U.S. (mostly a non-recourse economy) and European economies with recourse mortgage systems (Iraola et al., 2019).

e. I think recourse on mortgage should be applied in China and this is also in accordance with the current regulations in China where mortgages loans are recourse and lenders can go after other assets besides the house when enforcing the mortgage (Koss and Shi, 2018). Recourse can greatly suppress the real estate speculation by making it impossible to just walk away when the house price declines and to earn the benefits if price goes up. And as is explained in (c), recourse can reduce the systematic risk in the mortgage market, which can be quite beneficial to our economy as a whole.

Problem 4

Bankruptcy and Chapter 11: In the U.S, companies in financial difficulties can file for Chapter 11 bankruptcy protection. This protection includes (among other things):

i. Automatic stay: Block creditors from seizing collateral or taking any other action to collect their debt.

ii. Debtor in Possession Financing (DIP): Creditors lending money to the company are given super priority status. This means they are first to be paid in case the company is liquidated.

a. Analyze automatic stay: what do you think is the purpose of this type of protection. Do you think it is beneficial to have this type of protection for companies?

b. Analyze debtor in possession financing: what is purpose of this provision? Does this make it easier or harder for the company to borrow funds? Why?

c. Overall, what do you think is the purpose of Chapter 11?

Solution:

a. There are two main purposes of the Automatic stay. It protects debtors from creditors by freezing their claims on property, collateral, and assets until bankruptcy court proceedings are completed (Kagan, 2018). Also, automatic stay is to put all creditors on a level playing field and prevent one creditor from seizing a debtor's assets before others have had the opportunity to do so. Therefore, the automatic stay is beneficial for the debtors.

b. DIP financing can allow funding for positive net present value projects which increases the likelihood of reorganization and reduces time in bankruptcy (Dahiya et al., 2003).

   This make it easier for the company to borrow funds by giving its post-bankruptcy lenders protection in the form of a senior lien position. In this case, DIP financing usually has priority over existing debt, equity and other claims.

c. Chapter 11 seeks a reorganization rather than liquidation of the assets, which is different from Chapter 7. A chapter 11 debtor usually proposes a plan of reorganization to keep its business alive and pay creditors over time Adams (1993). In this instance, DIP financed firms are more likely to emerge from Chapter 11 than non-DIP financed firms. They have a shorter reorganization period and they are quicker to emerge and also quicker to liquidate.

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