

POLITECNICO DI MILANO

School of Industrial and Information Engineering

Management Engineering



The Liquidity Trap in a Debt Constrained Scenario

Supervisor:

Prof. Anna Paola Florio

Candidate:

Raphael Mattei da Silva

779382

Academic Year 2012-2013

Para Vovó

Acknowledgements

In the first place I would like to thank my mother, who was always there to remind me “who I really am”, who is probably someone that I will only meet in the long run future. I am thankful to my father who provided me all the wisdom of a father; to my grandmother who one day told me I would not manage to do it like that and made me get here where I am; and to the rest of my family.

I would like to express my special thanks and gratitude to Professor Anna Florio for the opportunity to do this project. She decided to accept a random foreign student and became the mentor of this thesis, helping me a lot with many helpful comments, ideas and suggestions, even when time was short.

Gianluca Testa and Vittorio Cicchetti were the ones with which the ideas of this thesis were first born, under a small project to the International Economics course. Thank you a lot for your discussions on the subject and I forgive you guys for being constantly late to the meetings. A thanks to my friend Ludovica Scarfi as well, who was there to help me with this work when I mostly needed.

My deepest appreciation to my good friends that lived with me in these past 2 years in the Residence of Galileo Galilei, Caio, Carlos Alberto, Rodolfo and Rodrigo; to the friends that are far away; and to the friends that are already gone. Thank you all for the good memories.

Also, I thank Escola Politécnica da USP and the CRInt, for giving me the opportunity to come here; and Politecnico di Milano and all of its professors, for all of the knowledge and great experience provided.

The help of CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior), which provided the financial support through the Science Without Borders program in the second year of my double degree in Italy, is acknowledged.

Last but not least, to my Ida, who, with love, endured and helped me endure these past months, thank you for everything.

“The only thing we have to fear is fear itself”,

F.D. Roosevelt.

Table of Contents

Table of Contents	5
List of Figures	7
Abstract	8
Abstract Italiano	9
Sommario	10
Introduction	14
Chapter I: The Liquidity Trap	17
1.1. Introduction	17
1.2. The concept and its evolution	20
1.3. But how did we enter a liquidity trap?	23
1.4. Understanding the Liquidity Trap: A Modern Approach	25
1.5. The problem	28
1.5.1. The deflation problem	28
1.5.2. The excessive savings problem	29
1.5.3. The aggregate demand problem	30
1.5.4. The output-gap problem	31
1.6. Conclusion	31
Chapter II: Getting out of a liquidity trap	33
2.1. Introduction	33
2.2. Monetary Policies	33
2.2.1 Unconventional Monetary Policies	33
2.3. Fiscal Policies	39
2.4. Conclusions	40
Chapter III: Debt, Fiscal Policy and the Austerians	42
3.1. Introduction	42
3.2. Debt	43
3.3. Debt and Fiscal Policies	47

3.3.1. Crowding out	47
3.3.2. Non-Keynesian effects of Fiscal Expansions	49
3.4. Supply-side effects of fiscal policies	52
3.5. Austerity.....	52
3.6. The criticism to austerity	54
3.7. Conclusion	56
Chapter IV: Leveraging Cycles and Debt-Deflation	58
4.1. Introduction.....	58
4.2. The Leverage Cycle	58
4.3. Debt Deflation.....	63
4.3.1. Fisher.....	63
4.3.2. A modern look	63
4.4. McCulley framework	70
4.5. Conclusion	74
Some proposals and Conclusions.....	77
References.....	85

List of Figures

Figure 1.1. IS-LM in a liquidity trap	18
Figure 1.2. Central-bank base rates	19
Figure 1.3. Keynesian aggregate demand and supply	20
Figure 1.4. The IS-LM and The IS-LM in a liquidity trap	22
Figure 1.5. NFC borrowing rates and NFCs loans outstanding	24
Figure 1.6. Multiple equilibrium in an economy	25
Figure 1.7. IS-LM based in the representative agent model	27
Figure 1.8. Excess savings in a liquidity trap	30
Figure 1.9. AD-AS in a liquidity trap	30
Figure 1.10. The UK output gap.....	31
Figure 2.1. Channels through which the quantitative easing can affect inflation goal.....	34
Figure 3.1. Average gross debt in G7 economies.....	42
Figure 3.2. Debt over GDP for OECD countries	43
Figure 3.3. Denmark – Index of consumers’ confidence.....	54
Figure 4.1. Optimistic agents, pessimistic agents and there division.....	59
Figure 4.2. The Housing Leverage Cycle	61
Figure 4.3. Volatility in the housing market	61
Figure 4.4. Volume of CDSs (Credit Default Swaps)	62
Figure 4.5. Topsy turvy economics	68
Figure 4.6. The paradox of toil and the paradox of flexibility.....	69
Figure 4.7. Leveraging and deleveraging in the McCulley framework.....	71
Figure 4.8. McCulley framework	73

Abstract

Advanced economies are now in a situation of very weak growth figures and above the average unemployment. This is the result of 2007-2008 financial crisis, which pushed them into the so called liquidity trap. This thesis discusses this issue, focusing on assessing the theoretical solutions to this problem in a debt constrained scenario.

First a characterization of the liquidity trap was made, studying the different literature on the subject to find out what a liquidity trap is and how a country can fall into it; Second, it was studied what the literature says on how to get out of such a situation. A focus was put more on monetary policy; Third, it was studied the literature on the influence of debt in fiscal policies; and also a literature that attempts to put both problems together, by focusing on Irving Fisher's debt-deflation theory.

I find out that the liquidity trap can be understood as a multiple-equilibrium problem in which an economy is trapped into a low level equilibrium. Problems that arise from this are constrained aggregate demand, excess savings, deflationary pressures and an output gap problem. Monetary solutions involve quantitative easing and expectation of inflation creation. Fiscal solutions in a high debt scenario are challenging, as debt offers an upper bound to fiscal policies. In this case Keynesian and non-Keynesian negative effects on the fiscal multiplier must be taken care of.

The leverage cycle is what causes all of this, as an excessively high leverage in the economy can cause an asset price bubble. This, when busted, pushes the whole economy into deleveraging. If the crash is sufficiently strong, the economy will enter in a liquidity trap. Debt deleveraging then becomes a problem and generates a topsy-turvy economics world.

To conclude, I contextualize the liquidity trap problem and suggest some ideas on fiscal policies that do not make the debt problem unsustainable, which are: changing the fiscal expenditures composition, privatizations and credibly committing to a sustainable debt level in the future.

Abstract Italiano

La condizione económica delle economie avanzate è di crescite sempre più deboli, fino ad arrivare, in taluni casi, ad una forte recessione e disoccupazione nettamente sopra la media. Tutto questo è il risultato della crisi finanziaria del 2007-2008 che ha portato queste economie ad una condizione nota come “trappola della liquidità”. La presente tesi discute proprio questo problema, concentrandosi nel trovare e verificare soluzioni teoriche per i paesi oberati dal debito.

A tale scopo è stato effettuato un primo studio della letteratura disponibile per capire le caratterizzazioni della trappola della liquidità e le ragioni che portano un paese in una tale situazione; conseguentemente a questo si è cercato di individuare anche le possibili soluzioni per la ripresa. Successivamente si è cercato di capire come il debito influenzi le politiche fiscali ed infine, si è creata la liaison di questi due concetti, la trappola della liquidità e il debito, per studiarne le interazioni e le influenze reciproche.

Per quanto riguarda la trappola della liquidità si è capito che questa può essere interpretata, in un’ottica di equilibrio multiplo, come quella condizione in cui un’economia è intrappolata in un equilibrio di basso livello dove l’occupazione e il reddito sono più bassi di quelli ottimali. Le soluzioni individuate riguardano le politiche monetarie e fiscali. Le prime coinvolgono *quantitative easing* così come la creazione di aspettative di inflazione. Le soluzioni fiscali, a sua volta, offrono una grande sfida, una volta che, in un scenario di livelli alti del debito, questo offre un limite superiore per la spesa pubblica. In questo caso si deve fare attenzione agli effetti negativi Keynesiani e non-Keynesiani sul moltiplicatore fiscale.

Come causa di tutto questo è stato individuato il ciclo di leva in quanto un grado di leva troppo elevato può causare una bolla nei prezzi degli asset che però, scoppiando, spinge l’economia a diminuire il grado di leva. Se tale crollo sarà sufficientemente forte, l’economia entrerà nella fase di trappola della liquidità, la deflazione debitoria diventerà allora un problema creando un mondo economico detto *topsy-turvy*.

Sommario

La trappola della liquidità è una situazione dove la politica monetaria perde la sua efficacia e, a causa di una diminuzione del tasso d'interesse, non riesce più a stimolare l'economia. In questa situazione la conduzione di una politica monetaria diventa sostanzialmente più difficile.

L'ipotesi di base di questa tesi è che è stato il debito a portare le economie avanzate a questo punto di crisi finanziaria. Naturalmente il debito, come fattore fondamentale, non può essere trascurato nella ricerca di una soluzione esaustiva e pertanto si è reso necessario uno studio approfondito delle interazioni tra la trappola della liquidità e il problema del debito, specialmente per ciò che riguarda l'influenza del debito sovrano sulle politiche fiscali.

Per capire questo problema nel primo capitolo è stato fatto uno studio approfondito sulle caratteristiche della trappola della liquidità, studiando la letteratura a disposizione sul tema per scoprire che cosa si intende per trappola della liquidità e le ragioni che portano un paese a finire in questa situazione; nel secondo capitolo si sono approfonditi i temi legati alle politiche monetarie e fiscali e come queste si mettono a servizio dei paesi che vogliono uscire da quella limitante condizione. In questo contesto ci si è focalizzati maggiormente sulle politiche monetarie perchè, in generale, sono quelle ritenute più complesse in una situazione di trappola della liquidità. Il terzo capitolo è stato dedicato allo studio delle politiche di austerità, dell'influenza del debito nelle politiche fiscali e i suoi effetti negativi, keynesiani e non-keynesiani, sul moltiplicatore fiscale. Infine nel quarto capitolo si è creato il *trait d'union* tra le due problematiche concentrandosi sulla teoria del debito deflazionario delle grande depressioni di Irving Fisher.

Come appena detto, nel primo capitolo sono stati delineati i tratti caratteristici della trappola della liquidità e le proposte teoriche classiche e moderne che la sostengono. Nella definizione di questi tratti un ruolo di fondamentale importanza è ricoperto da Keynes che è stato il primo a descriverla così come la conosciamo e

studiamo e Hicks che è colui che la ha dato un volto; ma è stato Krugman il primo ad averla veramente vista con un approccio moderno. Una conclusione importante che emerge da questo primo capitolo è che, in un'ottica di equilibrio multiplo, la trappola della liquidità può essere capita come un equilibrio di basso livello. Questo è risultato di aspettative pessimistiche sul futuro della domanda aggregata da parte delle imprese che, come conseguenza di una *self-fulfilling prophecy*¹, generano un equilibrio di basso livello in cui l'occupazione e il reddito sono più bassi di quelli naturali. Si nota così come la trappola della liquidità è principalmente un problema delle aspettative e di credibilità.

Nel secondo capitolo abbiamo visto che, per uscire da una condizione di trappola della liquidità, l'economia può seguire essenzialmente due strade: attuare politiche fiscali o monetarie. Le prime, date le circostanze, sono davvero difficili da perseguire in quanto "non è sufficiente la mera politica fiscale per produrre crescita, ma deve anche portare a grandi aumenti della domanda privata" (Krugman). Le politiche monetarie, però, offrono una sfida ancora più grande perché in fase di trappola della liquidità le politiche monetarie standard sono inefficaci e quindi devono essere sperimentate politiche monetarie innovative che possono includere *Quantitative Easing*, operazioni di mercato aperto non convenzionali, cambiamento delle aspettative di inflazione e la combinazione descritta dal "metodo infallibile di Svensson".

Nel terzo capitolo sono stati trattati i temi relativi agli effetti del debito sulla politica fiscale e le conseguenze delle politiche di austerità. Il problema del debito, offrendo un limite superiore oltre il quale le politiche fiscali espansive non possono essere perseguite, non può essere in questa sede ignorato e pertanto sono state effettuate analisi sulle conseguenze del debito nelle politiche fiscali. Tali conseguenze possono avvenire sia dal lato della domanda che dal lato dell'offerta e in particolare nel primo caso entrambi effetti keynesiani (*crowding out*) e non-keynesiani (equivalenza ricardiana, *consumption smoothing*) possono occorrere

¹Nel modello di Benhabib (2013), le decisioni di investimento delle imprese dipendono dalle sue aspettative sulla domanda aggregata nel futuro, che, a sua volta, è definita stocasticamente dalle decisioni di investimento del passato.

nelle politiche fiscali espansive. Dal lato dell'offerta, invece, si è scoperto che le modalità di spesa del governo sono altrettanto importanti quanto l'ammontare speso. A conclusione di questo capitolo sono state trattate le politiche di austerità, di cui si dibatte tanto oggi, capendo che, nonostante sia una politica efficace in certe occasioni, non è sempre adeguata. L'austerità è una buona politica quando l'economia è limitata dall'offerta, che non sembra il caso odierno.

Nel quarto capitolo sono state studiate le teorie che combinano il problema del debito con la trappola della liquidità. In primo luogo è stata analizzata la teoria del Geanakoplos (2010), il ciclo di leva, che spiega come il prezzo dei beni dipenda non solo dei tassi di interesse di una economia, ma anche dai tassi dei collateral applicati quando una società o un individuo chiedono un prestito per acquistare un attivo. Esiste allora una situazione in cui più alta è la leva finanziaria, più alti sono i prezzi degli asset e più leva chiederanno i compratori; estremizzando è la situazione in cui pochi compratori ottimistici possono avere il potere di acquistare una buona parte del mercato. Questo cambia in presenza di notizie "spaventosamente negative" in cui anche gli acquirenti più ottimisti diventano consapevoli della sopravvalutazione dei beni spingendo l'economia ad entrare in una fase di diminuzione del grado di leva.

Successivamente, Krugman e Eggertsson (2012) spiegano che cosa accade quando un'economia entra in una fase di riduzione della leva finanziaria e come questo possa spingere l'economia in una trappola della liquidità. Per fare questo loro si basano sulla teoria del debito-deflazionario delle grandi depressioni di Fisher che mostra come, quando un'economia diminuisce il suo grado di leva, il valore reale del debito in realtà aumenta. Questo, come Krugman e Eggertsson hanno mostrato, spingerà l'economia in un mondo dove tutto sarà capovolto.

Infine è stato analizzato il *framework* di McCulley (2013), dove l'autore mostra le diverse combinazioni di politiche fiscali e monetarie in diversi gradi di leva. Per uscire da una trappola della liquidità McCulley difende l'idea di collaborazione fiscale e monetaria in cui la banca centrale, detenendo il diritto di stampare moneta, finanzia l'autorità fiscale.

Per concludere, io ho contestualizzato il problema della trappola della liquidità e ho suggerito qualche idea per perseguire politiche fiscali espansive che non gravino sul problema del debito; tra le quali: cambiare la composizione della spesa pubblica, attuare politiche di privatizzazioni o vincolarsi credibilmente per raggiungere un livello sostenibile di debito nel futuro.

Introduction

The liquidity trap is a situation in which the nominal interest rates reach a level of or very near zero. Following Keynes' reasoning, in such a situation, monetary policies lose their effectiveness, due to the fact that any increase in quantity of money would just fall into unused liquidity.

In this thesis I intend to have a look into the factors that influence the economy in a liquidity trap situation and how to get out of it, with particular attention to a case of an economy in a debt constrained scenario. I pretend to look with some depth into how a liquidity trap comes to existence, with special attention to Irving Fisher's framework of debt deflation and its connection to such a situation. I wish to understand how the deleveraging of the economy happens and which policies the Central Bank and Fiscal Authority can pursue in a deleveraging situation. Afterwards, I want to analyze the market and its reactions in these situations.

The importance of the liquidity trap comes from today's economic situation in advanced economies, Japan being the most clear example. The US, even though presents good signs of recovery, still has a Zero Interest Rate Policy (ZIRP) and high rates of unemployment. Europe presents a special case for how its fiscal and monetary institutions are designed; and it's probably in this case, that the situation is most complicated: contrary to the US, its big economies are in, or close to, recession. But given market (and European) constraints, they cannot pursue expansionary fiscal policies, but must go through austerity measures; and the regulatory framework for policies of the ECB makes it improbable the usage of radical measures such as Quantitative Easing will be seen in Europe.

Therefore, the goal of this thesis is to assess what has been already written in the subject of liquidity trap and also the problems that arise from a highly indebted economy, understanding the connection between both problems. The final goal is to determine the factors that influence policies in economies that are found

in a situation such as the one that advanced economies are facing today and make a contextualization of the current economic situation under the light of the theory studied.

The hypothesis of this thesis is that, debt has been what brought advanced economies to this point of the Financial Crisis. Naturally, debt must be considered as a fundamental factor into how to get out of it. A more in-depth research on the interactions between the liquidity trap and the debt problem is needed, especially into what concerns the influence of sovereign debt in fiscal policies. By the times of Franklin D. Roosevelt, when the US and other economies are assumed to have entered in a liquidity trap for the first time, such problem was not of big importance, as the North American debt level was around 16%. Even though private debt might have been an issue, as Fisher (1933) says, the low levels of debt that the country had, previous to the crisis, means that the government had much more space to pursue expansionary fiscal policies on its aftermath.

In order to understand this problem, this thesis is divided in four chapters. In the first two chapter I'll make a literature review on the liquidity trap basing myself on whom I consider to be the main authors (Krugman, Eggertsson, Svensson and Woodford). These are mainly Keynesians or new-Keynesians economists, who are, appropriately, the best to describe the situation to which Keynes theory was created. We can see that since Krugman's first paper on the subject in 1998, the academic circle suffered a boom in papers discussing the issue. The first chapter seeks to sum up the literature that deals with the liquidity trap, with the goal of creating a characterization to it.

The second chapter will also deal with the liquidity trap, but focuses more on solutions to it. In this chapter I'll talk about what the literature says on how monetary and fiscal policies can proceed in order take the economy out of the ZIRP. In this chapter I'll focus more on monetary policies though. That is because most of the solutions to the liquidity trap concentrate on this part and also because most of the economists studied here, defend that, even though the nominal interest rates are at the zero level, there's more that can be done by the monetary authority.

In the third chapter I study the literature on fiscal policies and the effect of debt in fiscal policies. The debt literature that I refer to is the one concerning debt management, debt problems and their influence in pursuing fiscal policies and austerity. The 90s and 00s offered quite a big influx of ideas in the subject of fiscal contractions and “expansionary” fiscal contractions. I’ll make a review of some of these arguments with a special focus on fiscal policies and the effects of sovereign debt in fiscal policies. The importance of debt comes from the fact that it acts as a limit over which countries cannot (or they can at really limited pace) pursue fiscal expansions anymore.

So, in certain senses we are analysing here two different branches of literature. One that is more Keynesian and deals with the monetary solutions to a monetary problem, helped by fiscal policies; and the other deals with both Keynesian and non-Keynesian effects of debt in fiscal policies.

Therefore, the fourth chapter will be a sum up of the literature that, in certain senses, helps to bind the liquidity trap and the debt problem together. It is a literature on leverage cycles, debt-deflation and the connection between both. This is quite a new literature, even though it has its roots in the work of the economist Irving Fisher. It discusses mostly great crisis and how they come to happen by dealing with which factors that lead to the creation of bubbles, what causes them to burst and the following consequences. This is an important literature, as it shed some lights how we came to enter the situation in which we are right now and some possible actions to follow.

As for what concerns the interaction between the influence of sovereign debt in fiscal policies and the liquidity trap, little was said in the form of papers (I can mention DeLong and Summers, 2010); and there is a lot in debates over the need for austerity and its consequences, especially in newspapers and media (for example, the discussions between the Princeton economist Krugman and the political journalist Michael Kinsley).

Chapter I: The Liquidity Trap

1.1. Introduction

The liquidity trap is a situation in which monetary policy cannot stimulate the economy by lowering the nominal interest rate anymore. In such situation, conducting monetary policies becomes substantially harder (Svensson, 2006).

In Keynes (1936) understanding, the supply of money is connected to the interest rate (Hicks, 1937). Monetary policy works when the central bank, by printing money, buys short-term government bonds, increases the monetary base and lowers nominal interest rate.

In a zero interest rate condition, injecting more money into the economy does not work, once bonds and money become perfect substitutes and thus buying short-term monetary bonds does not increase the monetary base. If it did indeed go below zero, an alternative to investing in short government bonds is simply to hold cash at zero interest rates (Hicks, 1937; Svensson, 2000).

The liquidity trap is then a situation in which the central bank, by trying to stimulate the economy, reaches the lower bound. In such situation, even if the central bank pumps more money into the economy, it will not reach the real economy and it will be hoarded as liquidity. Interest rate is then trapped at zero, for it cannot go down or go up.

The Liquidity Trap in a Debt Constrained Scenario

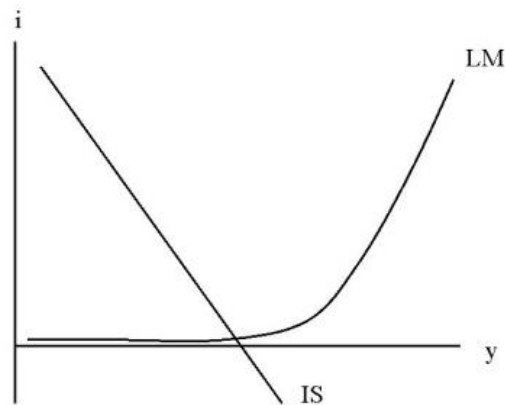


Figure 1.1. IS-LM in a liquidity trap Source: Krugman (2000)

Figure 1.1 shows what the liquidity trap means in the classical IS-LM representation. When the economy contracts, given an outside shock (such as the financial crisis), the IS is pushed too much to the left, and thus, to an area of zero interest rate. The immediate answer to such shock is to make a monetary expansion, but in this area the LM is flat and dislocating the LM to the right (the effect of a monetary expansion) won't change the short-term equilibrium, trapping the economy at a low-level interest rate.

Some authors claim that the advanced economies, after the crash of 1929, were found to be in this situation. The first modern case of such condition was Japan. After decades of extremely high economic growth, Japan suffered a big crisis in the 90s which led to, up to now, two decades of stagnation and constant deflationary pressures. Up to now (2013) Japan is still facing constant deflation, with the last available data showing a CPI (consumer price index) contraction of -0.4%.

But Japan has not been the only large economy to be in such condition. After the financial crisis of 2008, interest rates in nearly all large, advanced economies are at or really close to the zero nominal interest rate for almost 4 years now, as we can see in the graph below (figure 1.2). Forecasts on this graphic built by The Economist show that they will stay there for quite a while.

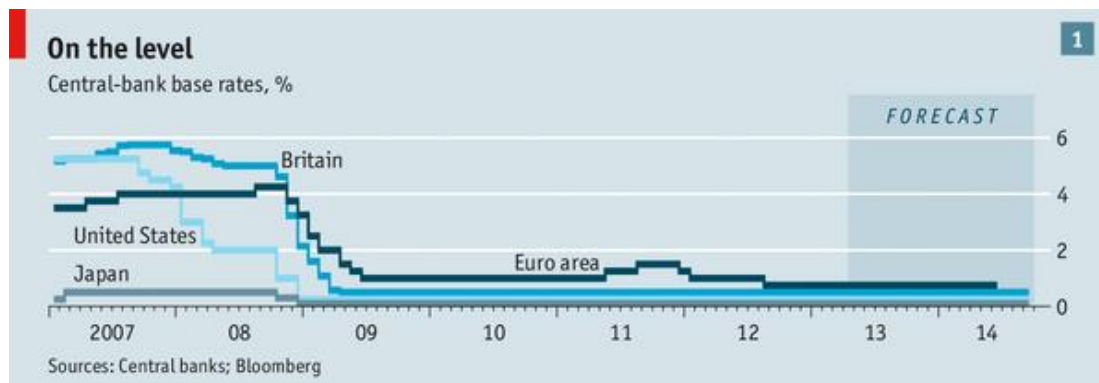


Figure 1.2. Central-bank base rates; Source: *The Economist*

In such a situation countries are trapped in a low growth, low inflation and low interest rates scenario. Going out of it is nowhere near easy or obvious. Japan has been trying for two decades and still hasn't had any success². But why do we need to get out of this situation?

The main danger from the liquidity trap comes from what Blanchard (2000) shows by pointing out that in Japan ever since the beginning of the 90s has a low level of growth. This can be either the result of a decrease in the natural level of output (given structural problems) or a constant deviation of output from its natural level to a lower level. Blanchard agrees with the second. In fact, the Phillips curve says that when inflation is rising it is a signal that output is above its natural level and when inflation is declining that it is below.

In Japan, though, inflation has stabilized at low levels (deflation in fact). However this does not mean that the country is in its natural output. In fact, as Blanchard defends, it can mean that, in reverse to what happened in the 70s, the Phillips curve changed from a relation between unemployment and change of inflation rate to a relation between unemployment and the level of inflation rate and thus, low inflation is the signal that output is too low.

But this is not different from the low level equilibrium of Keynes (1936), as shown in figure 1.3, in which aggregate demand is in equilibrium with aggregate

² Abenomics, which will be discussed later on, seems to be changing that.

supply in a level below natural output. In conclusion, a liquidity trap can cause a long period of slump given a low level equilibrium.

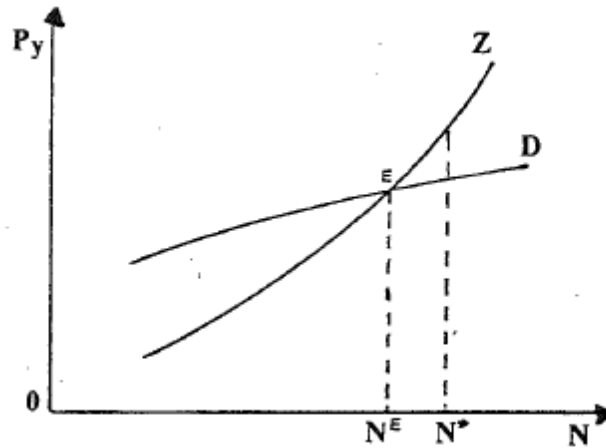


Figure 1.3. Keynesian aggregate demand and supply; Boitani (1986)

1.2. The concept and its evolution

In his seminal work Keynes (1936) defined the following equation as dictating the demand and supply of money:

$$[1.1] \quad M = M_1 + M_2 = L_1(Y, P) + L_2(r, \rho)$$

In this equation we can see that the supply for money (M) meets the need of two different demands for money. One is the transactions and precautionary motives (M_1) and the other is the liquidity and speculative motives (M_2). An increase in the monetary base can influence M_1 or M_2 . When it increases the first, it can either increase the output (Y) or the price levels (P). This represents the monetarist view, or what Keynes calls the classics. When it increases the latter, we have that money is either hoarded (there is a change in the liquidity preference function – ρ) or used as speculative reasons, which affects the interest rate (r). Usually an increase in the monetary base has an influence on both, but when a

monetary expansion is completely “absorbed” by the M_2 , it fails to influence the economy.

Basing himself on this liquidity function, Keynes identified four different types of limitations to the ability of the monetary authority to establish any given complex of rates of interest for debts of different terms and risks.

The four limitations are:

- 1) Limitations connected to the monetary authority willingness of dealing only with debts of a certain kind;
- 2) Limitations connected to a situation in which the rate of interest gets under a certain rate under which liquidity-preference becomes absolute;
- 3) Limitations connected to a completely breakdown of stability in interest rates, due to the liquidity function flattening out, given, for example, a flight from currency;
- 4) Limitations connected to what Keynes calls the moral-risk, or the risk of someone not paying. This risk makes it impossible for bank rates to go beyond a certain level, even when nominal rates are zero;

From these “challenges”, it’s the second one that describes the liquidity trap. With the equation [1.1] we can see that, from a certain level, increasing the amount of money in the economy will be no longer connected with the transactional motive (M_1) and will unload in the amount of money held for speculative motive (M_2). In that situation, increasing the amount of money in the economy will have no further effect in the real economy. When that happens, the economy finds itself in a liquidity trap.

Nowadays, what we can see is also a combination with the fourth limitation: the moral-risk. This is basically seen as the spread and we’ll see a better discussion in the next topic.

It is important to notice that, although many point to the 1930s experience as one possible example of a liquidity trap, it cannot be said for sure. Keynes himself said that his second point was no more than a theoretical possibility that might come into existence in the future. Orphanides (2003), summing up the discussion that developed during the decades after the crash of 1929, confirms that, by saying that the biggest problem in the recovery of the Great Recession was actually an incorrect understanding of how monetary policy works in an environment of very low short-term nominal interest rates.

Hicks (1937), analyzing the work of Keynes, builds the framework for what is known today as the IS-LM. In doing so, the author actually recognizes the form of the LM curve as being Keynes most important contribution, when showing that there is a level under which the interest rate is unlikely to go. Hicks also points out that the Keynes theory is most likely to work in this condition of low interest rates, “when a rise in the marginal efficiency of capital only increases employment and does not raise the rate of interest at all”, in the author’s words.

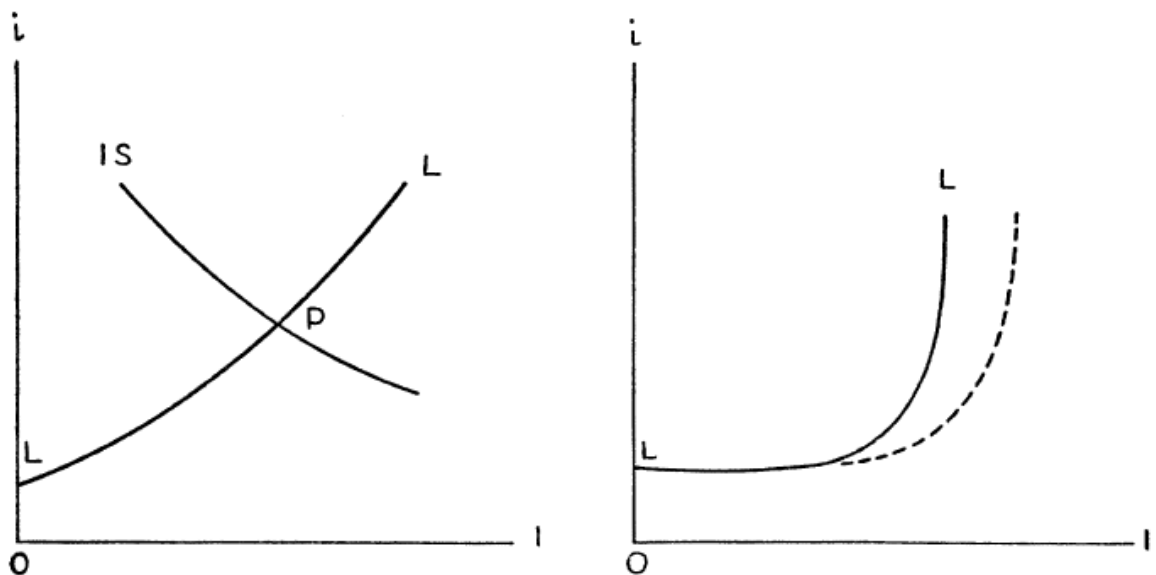


Figure 1.4. The IS-LM and The IS-LM in a liquidity trap, as represented by Hicks; Source: Hicks (1937)

The reason given by Hicks for the nominal interest rates not being able to be under zero is the one I already mentioned before: once the rate is lower than zero it is more profitable to hold money than to lend it out. When near zero, the author observed as well, long-term bonds won't be able to fall the same amount as the short terms will.

1.3. But how did we enter a liquidity trap?

The textbook explanation (Blanchard, 2006) shows us in a simple way through the ISLM model how did the crisis happen. His model begins with the analysis of the crash in the housing markets (of -30%). The steep fall in the housing markets led to the failure of Fannie Mae, Freddie Mac and later on Lehmans Brothers which led to a collapse on the stock market (-20%). Together, these drops accounted for a drop in 15% of Americans wealth, which caused a drop in the consumption. The drop in consumption finally led to a drop in the country GDP. But this alone, according to Blanchard, was not the main cause of the crisis. The biggest problem was a big increase on the spread³.

Putting this into an IS-LM framework, the shock which the economy suffered was a shock into the IS side of the curve. That happened through the increase in the spread charged by the banks. To consider this let's look into a IS curve where the investments equation is:

$$[1.2] \quad I = I(Y, \rho)$$

In this equation, Y is the country's product and ρ is the interest rate as seen by consumers, which is a result of the deposit rate, i , plus a given spread

$$[1.3] \quad \rho = i + x$$

³ Which is connected to both the moral risk and also the liquidity function mentioned previously in the work of Keynes (1936).

The spread, on the other hand, is itself a function of the capital of the banks (supply – A^B) and the capital of the companies (related to the risk of a lending operation – A^F). Both are negatively related to the spread, meaning that, when either of them increases, the spread decreases.

$$[1.4] \quad x = x(A^B, A^F)$$

The spread, thus, is directly connected to the investment function. A decrease in the capital of banks caused the rise of the spread, which decreased the investment level and pushed the IS curve to the left, resulting in a lower production level.

As we can see from the graphic below for the non-financial corporations in Italy and France, the spread has raised quite a lot after the beginning of the financial crisis.

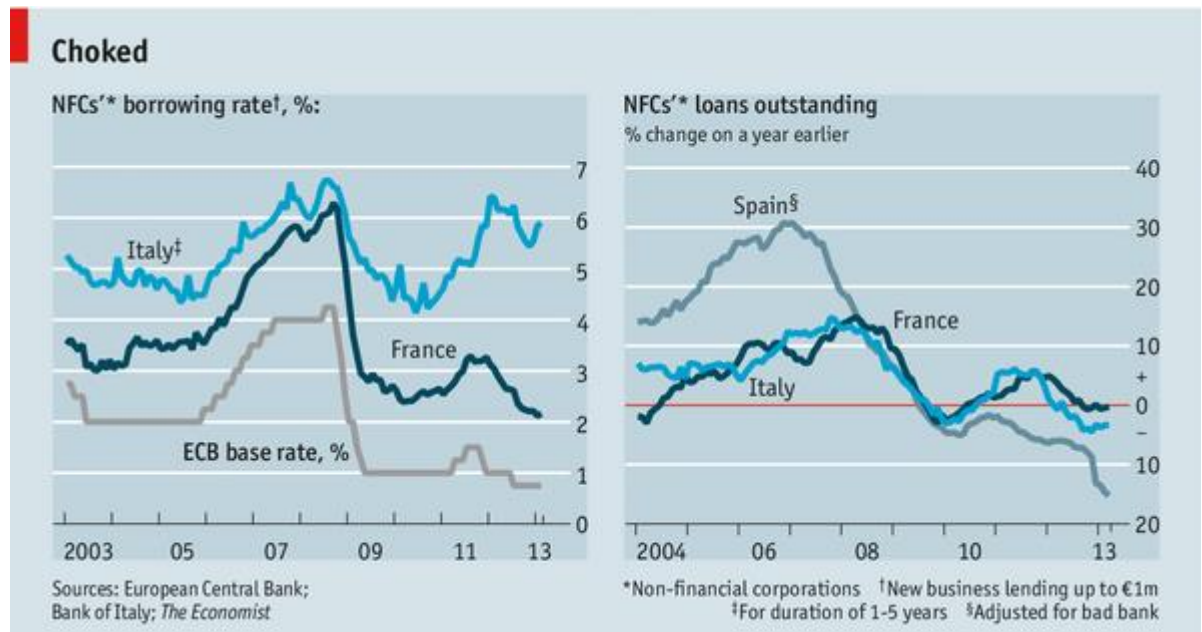


Figure 1.5. NFC borrowing rates and NFCs loans outstanding; Source: The Economist

1.4. Understanding the Liquidity Trap: A Modern Approach

Previously I've presented the Keynesian and Hicksian view of the liquidity trap. The IS-LM model, though, is considered a faulty model for not taking into consideration issues such price determination, consequences of capital accumulation, the determinants of consumer behavior, amongst others (Krugman, 1998). This way a modern approach to understand the liquidity trap is needed.

The best way we have to understand what a liquidity trap is comes from Krugman (2000). In this paper, Krugman mentions that the liquidity trap can be understood as a multiple-equilibrium problem, in which the liquidity trap represents a low-level equilibrium that comes as a result of self-fulfilling pessimism. A representation from this can be seen from the following simple multiple-equilibrium.

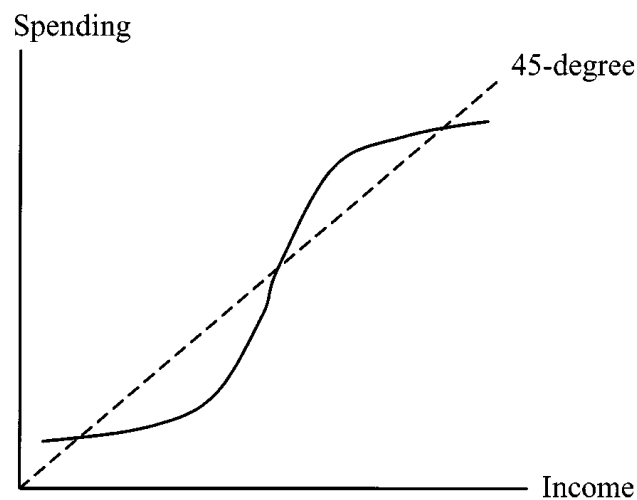


Figure 1.6. Multiple equilibrium in an economy Source: Krugman (2000)

A more in-depth discussion about multiple-equilibrium and below-target equilibria can be found in Alstadheim (2006), Benhabib (2001a) and Benhabib (2001b).

Benhabib (2013) builds a model based on the Keynesian idea that the investment (production and employment) decisions are based on expectations of aggregate demand driven by sentiments and the resulting demand is the result of these investment decisions. As a result, Benhabib finds that there can be a situation

in which serially correlated stochastic equilibria driven by self-fulfilling consumer sentiments exists.

As a consequence of this, the hypothesis of the liquidity trap being the result of self-fulfilling pessimism seems reasonable.

Now, in order to build a modern model to understand the liquidity trap, let's follow Krugman (2000) framework. In Krugman (2000), we can find a simple model to understand the liquidity trap outside an IS-LM framework, taking into consideration correct budget constraints, price variations and avoiding altering the individual's decision problem.

In this model there is a single consumption good, which drops like manna from heaven, so that consumption in each period is given. There is a representative individual who wants to maximize the following utility function:

$$[1.5] \quad U = \left(\frac{1}{\rho}\right) \cdot \sum_t D^t c_t^\rho$$

This representative individual is bonded by the following cash-in-advance constraint (for each period):

$$[1.6] \quad P_t c_t \leq M_t$$

Additional cash may be acquired, or excess cash disposed of, in a money-for-bonds market that takes place in the beginning of each period. This means that, given no uncertainty, under normal circumstances the cash-in-advance constraint will be binding. An Euler condition in consumption, the nominal interest rate, and prices is then implied:

$$[1.7] \quad (1 + i_t)(P_t/P_{t+1}) = (1/D)(c_{t+1}/c_t)^{-\rho}$$

These sets of equations, in equilibrium, will yield the following graphic, representing a sort of IS-LM represented in the i, P space. The IS represents the Euler condition and LM is defined by setting the cash-in-advance constraint to equality $Pc = M$. The equilibrium point of the two curves determines simultaneously the interest rate and the price level.

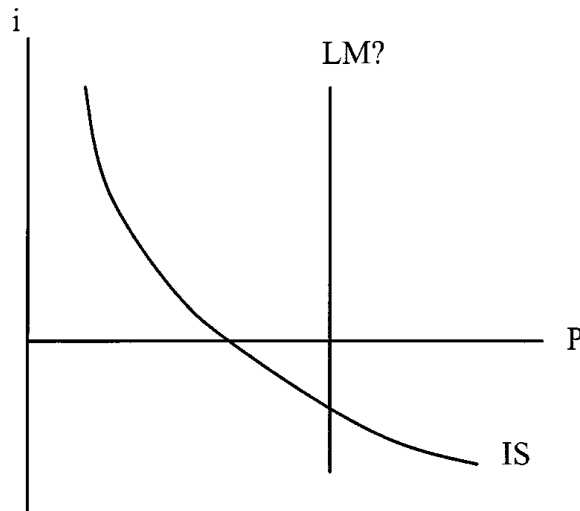


Figure 1.7. IS-LM based in the representative agent model; Source: Krugman (2000)

A liquidity trap is then possible. This happens because in the situation represented above, the money constraint is no longer in effect, because, as the equilibrium nominal rate is now below zero, when it actually can't, people will hold part of the total amount of money as liquidity. In this case, any increase in the money supply will have no effect on the economy (neither prices will go up, neither the interest rate level will go down). The economy is then in a liquidity trap, which means that this situation is not just a theoretical IS-LM model problem but can be a real problem (as shown by this model).

But what are the real implications of this finding? How does this reflect to the real world? According to Krugman, the first point that should be noted is that the monetary neutrality usually stated to defend the fact that any monetary expansion will lead to an equal expansion in price levels is somewhat wrong.

What actually happens is that an expansion in the current and all expected future money supplies, will bring an equal expansion in the price level (a more in depth discussion of this logic is given by Blanchard, 2000; Svensson, 2000; Eggertsson, 2003). This means that the liquidity trap is mainly an expectations and credibility problem. In the author's words:

“Monetary expansion is irrelevant because the private sector does not expect it to be sustained, because they believe that given a chance the central bank will revert to type and stabilize prices.”

1.5. The problem

But one might ask himself again, why is the liquidity trap such a big problem?

Even though they have described the theoretical possibility of a liquidity trap, it is my belief that Keynes and Hicks couldn't possibly foresee the actual implications of such an event.

I already pointed out before that the work of Blanchard (2000) tells us that, after a while, the liquidity trap can reduce potential output. Krugman (1998) theory also shows us that, by trying to deflate now to inflate later, given some downward price inflexibility, the economy's need for inflation will manifest itself in a real slump.

Therefore, the liquidity trap, when emerges as the result of a big crisis, traps the economy in a recessionary pattern, such as the one Japan has been for the past 20 years (Svenson, 2005). It is important to notice that, any increase in Japanese GDP in the past two decades was actually due to increase in the government consumption.

Economic consequences of a liquidity trap then can be summarized in the following points:

1.5.1. The deflation problem

In Krugman (1998) model we can understand why a liquidity trap implies deflation. In an one-good representative agent economy where the representative agent has an utility function

$$[1.8] \quad U = \frac{1}{1-\rho} \sum c_t^{1-\rho} D^t$$

c is the consumption within a period, D is the discount factor and ρ the relative risk aversion. Considering a two period horizon, with $P^* = M^*/y^*$ being the price level for the second period and $i^* = (1-D)/D$ the interest rate which will remain constant. The economy is constrained by the following cash-in-advance constraint.

$$[1.9] \quad P = M/y$$

With the marginal utility of the period one given by $c^{-\rho}$ we have that

$$[1.10] \quad (c/c^*)^{-\rho} = DP(1+i)/P^*$$

Or, since consumption must equal output in each period,

$$[1.11] \quad 1+i = \frac{P^*}{DP} (y^*/y)^\rho$$

Equation [1.11] tells us that, the higher the price level now with future price level fixed, the lower the nominal interest rate. If future output is lower than current output $(y/y^*)^\rho < D$, consequently current price levels are too high compared to what is expected for future price levels, what makes the economy deflate.

As the model I presented before shows, in a liquidity trap, the economy tries to deleverage now as a way of generating inflation. The consequence of this is deflation.

1.5.2. The excessive savings problem

A liquidity trap is also represented as an excess of savings in respect to investment possibilities. This basically means that the economy is “wasting resources” in savings while they could be “better employed” as consumption. In reality this so called problem is more a symptom than a cause, the symptom being the lack of investment possibilities given a limited aggregate demand or given a pessimistic expectation of future demand.

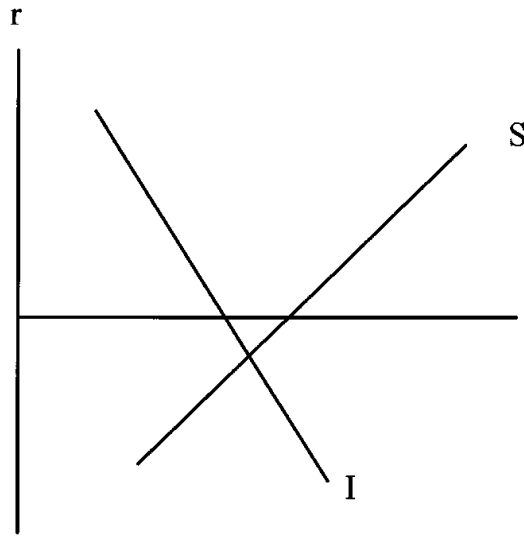


Figure 1.8. Excess savings in a liquidity trap; Source: Krugman (2000)

1.5.3. The aggregate demand problem

The multiple equilibrium theory that I presented before bares with it the fact that, as a consequence of general pessimism, the aggregate demand is constrained. In this situation the aggregate demand has the form show in figure 1.9 (Krugman, 2000).

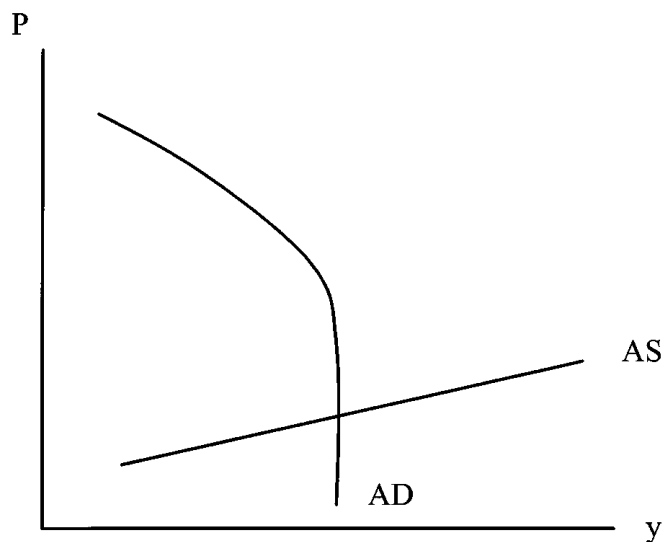
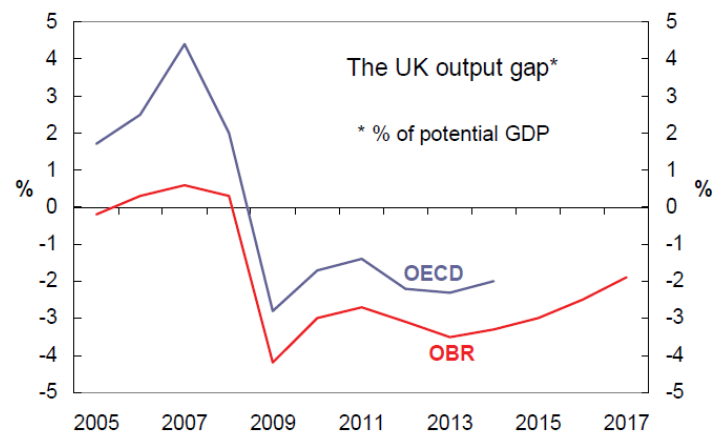


Figure 1.9. AD-AS in a liquidity trap; Source: Krugman (2000)

1.5.4. The output-gap problem

When aggregate demand is constrained below to the point it was expected in the past, the result is idle capacity. This idle capacity is translated into what we call output-gap, the latter being the difference between economic activity and potential output. The output-gap is connected to the deflation problem, because, once output is well below its potential level, with high unemployment, there will be a risk of price deflation, once companies will be lowering prices and reducing costs as a way of increasing demand.



Source: OECD, OBR

Figure 1.10. The UK output gap; Source: HSBC Economic Commentary, January 2013

With a constrained output-gap, the economy will be requiring negative real interest rates. But nominal interest rate cannot go below the zero boundary and, as we have deflation, the real interest rate is well above where it needs to be (Hall, 2011). In this case, aggregate demand cannot recover and the economy is trapped. If the deflation gets any higher than it already is, real interest rates will be even further from market clearing and the economy will be damaged even more.

1.6. Conclusion

In this chapter I presented a sum up of what the liquidity trap is. Beginning from the first recognitions of what a liquidity trap is by Keynes and Hicks through

how to get into one to a more modern approach to its understanding. In the end I presented some problems connected to it, in order to explain why the liquidity trap is dangerous. But now a problem emerges: How to get out?

Chapter II: Getting out of a liquidity trap

2.1. Introduction

In the previous chapter we saw, after a brief historic introduction, what a liquidity trap is and how an economy might end up into one. In this chapter we'll go through the different proposals into how to get out of such situation.

2.2. Monetary Policies

In a liquidity trap, conventional monetary policy (reducing the interest rate) is by definition, quite ineffective. Once the central bank has already reached the zero lower bound, there's nowhere else to go with the nominal interest rate. Printing money and raising the monetary aggregate also does not work, once bonds and money are perfect substitutes. This happens because, in such a situation, the character of optimal monetary policy is changed (Eggertson, 2003)

Eggertsson (2003) says that this way of thinking must be changed, once "the existence of the zero bound changes the character of optimal monetary policy".

2.2.1 Unconventional Monetary Policies

As a consequence from the fact that conventional monetary policies tend to be quite fruitless, unconventional monetary policies must be put in discussion. Krugman (2000) points some of them that can be followed. They are: quantitative easing, unconventional open-market operations and expectations.

2.2.1.1. Quantitative Easing

Quantitative easing is the name of the monetary policy pursued by a Central Bank that consists in changes in the composition and/or size of a central bank's balance sheet that are designed to ease liquidity and/or credit conditions (Blinder,

2010). The expansion of broad money is a key part of the transmission mechanism for this policy (Benford et al. 2009).

The reason a central bank pursues this policy is to either flatten the yield curve or to change the risk or liquidity spreads. It does the first through otherwise conventional open market purchases to buy long-term instead of short-term bills. This operation is based in a (perhaps) imperfect arbitrage along the yield curve. The second type of target aims at spreads from risky non-Treasury rates to riskless Treasuries. Reducing the spread will reduce the interest rate that matters⁴ for actual transactions, without having to move the riskless rates (Blinder, 2010). This way, there can be a further decrease of interest rates, generating more stimulus for the economy.

This general set up for quantitative easing gives us a range of combinations for the central bank to act when the zero lower bound is reached. The approach that central banks will give to it will depend on the structure of each economy and how companies and household obtain finance (Benford et al. 2009).

Benford et al. (2009) points the way quantitative easing works in order to reach the 2% inflation target of the Bank of England. There are three channels for that to happen: an increase in asset prices, an increase in money in the economy and expectations of inflation. Its working proposition is described in the figure 2.1 below.

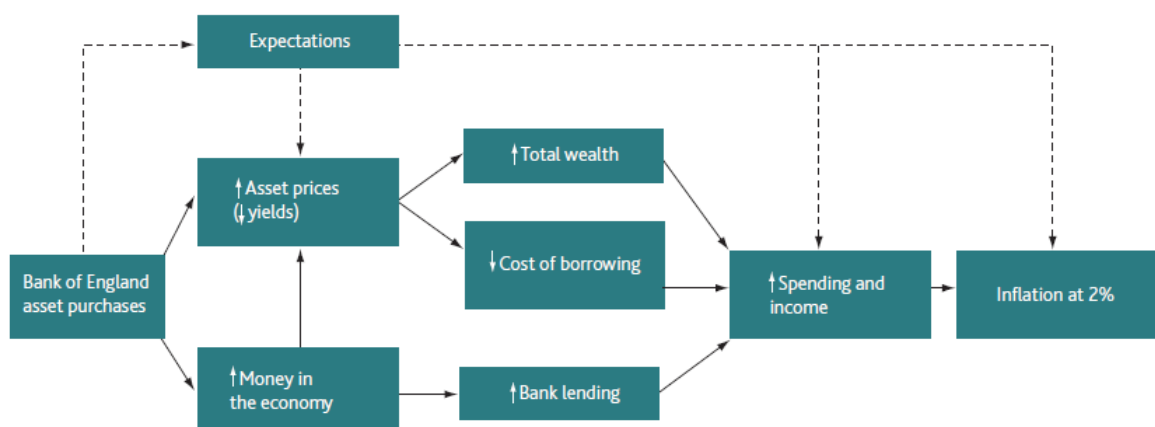


Figure 2.1. Channels through which the quantitative easing can affect inflation goal; Source: Bendford et al. (2009)

⁴ Private borrowing, lending and spending decisions depend on risky non-Treasury rates.

In the first path, an increase in demand of assets pushes up asset prices (and lower yields), which reduces the cost of borrowing for households and companies and increased demand. Alternatively, higher asset prices will have a wealth effect, as they will increase the net worth of asset holders.

In the second path, banks will end up with higher reserves in the central bank (Bank of England, in the example in question), as a result of the assets purchases. With higher reserves, which means more money in the economy, banks will be able to lend more which will result in more spending and income.

The last path mentioned is inflation expectations. The mere existence of quantitative easing, which is quite an exotic tool by itself, can be a demonstration of the central bank's willingness to fight deflationary feelings and achieve his inflation goal. This implies that real interest will be kept at a lower level for quite a while, increasing even more the spending (a further discussion on this subject will be developed in the session 2.2.1.3 of this chapter).

One thing must be noted though, which is that quantitative easing and inflation expectations are not exactly the same policy, although complementary. In the case of Japan (2001-2006), for example, quantitative easing failed to take the country out of deflation (Blinder, 2010). That can be mainly given to the fact that it was a policy based in decreasing riskless interest rate, but also because it failed to raise the inflation expectations necessary for inflation to consolidate.

The academic answer to this policy has been mixed. Bernanke (2004) seems to support it, pointing the fact that in the Japanese case it did indeed help to lower long term rates. Eggertsson and Woodford (2003) though, seem more skeptical about it, stating that open-market operations should be largely ineffective if it does not change expectations regarding future policy.

2.2.1.2 Unconventional open-market operations

Even though the central bank cannot influence the prices of bonds anymore there are other classes of assets that the central bank can buy in order to pursue monetary policy. These assets can be bought through open-market operations and,

given imperfect substitutability; the monetary policy can still have some effects on prices (Orphanides, 2003).

The idea behind unconventional open-market operations is thus the same as was presented under the banner of risky non-Treasury rates intervention in the previous quantitative easing discussion.

2.2.1.3. Expectations

The expectations type of unconventional monetary policy deals basically with the inflation targeting framework. This is born from the model we saw in the previous chapter that showed us that, in a liquidity trap, the market actually wants inflation, which can be translated in a negative real rate of interest. But to achieve that, one must increase the monetary base now and in all expected periods.

Blanchard (2000) builds a simple model to understand this process of building future inflation expectations. Letting $i_T \approx \frac{1}{T} |\sum_1^T i_{1t}^e|$ denote the T-year nominal rate where i_1 is the one year nominal rate. Then r_T is given by:

$$[2.1] \quad r_T \approx \frac{1}{T} |\sum_1^T i_{1t}^e - (\log P_T^e - \log P_0)|$$

Where P_T^e is the price level expected T years from now and P_0 is the price level today. This equation means that an increase in the expected price level T years from now will translate in an increase of the T-years real rate of interest $1/T$ times the increase of the price level.

In other words, using the example presented in this same work, this simple equation shows us that if, for example, the central bank wants to decrease the 10-year real rate by 200 points, all it needs to do is to convince that prices in 10 years from now will be 20% higher. To achieve this expectations the author suggests that just an announcement of an inflation targeting of 2% will already be enough to lower real interest rates by 2%.

The same would work on the exchange rate. Assuming that the interest parity holds and solving it forward we have:

$$[2.2] \quad e = \left| \frac{(1+i_T^*)^T}{(1+i_T)^T} \right| e_T^e$$

Where i_T^* denotes the T-period foreign nominal interest rate, i_T the domestic nominal interest rate, e the nominal exchange rate and e_T^e the expected nominal exchange rate T-period from now.

From this equation we can get to the conclusion that two things are important in defining the today exchange rate from a forward looking perspective: the state of the interest rates and the future expected exchange rate. It is important to point out that both ways of influencing the exchange rate are independent from each other. In a liquidity trap however, the nominal interest rate is already at its lower bound, which means that it can no longer influence the exchange rate. The future exchange rate, on the other hand can.

This future exchange rate is basically defined (assuming PPP holds) the same way as today's: through the relationship of prices. In this case, an increase of the future T domestic prices of x% will reflect in a devaluation today of x%.

In fact, as also Svensson (2005) proposes, a devaluation of the exchange rate can be considered as a good sign that the central bank managed to convince the market of the permanency and seriousness of its policy in setting an inflation targeting framework.

2.2.1.4. The Foolproof Way

The Foolproof Way (FPW) was first presented by Svensson in a conference organized by the Bank of Japan and later published as a paper as Svensson (2000). Its mechanism is remarkably similar to the one presented by Blanchard (2000). What this theory adds is, apart from the more formal proposal, the way how the policies are transmitted to the real economy.

It consists basically in a group of three policies to be followed (fragment adapted from Svensson (2000)):

- 1) A price-level target path $\{\hat{p}_{t_0}\}_{t=t_0}^{\infty}$ for the domestic price level,

$$[2.3] \quad \hat{p}_t = \hat{p}_{t_0} + \hat{\pi}(t - t_0)$$

With the price-level target for the current period t_0 being higher than the current price-level.

$$[2.4] \quad \hat{p}_{t_0} > p_{t_0}$$

Together with a small positive long-run inflation target (2 percent suggests the author)

$$[2.5] \quad \hat{\pi} > 0$$

2) Devaluation and peg of the currency level to a crawling exchange rate target to be held until the price level target has been reached,

$$[2.6] \quad s_t = \bar{s}_t, t \geq t_0$$

Where the exchange rate \bar{s}_t is defined by:

$$[2.7] \quad \bar{s}_t = \bar{s}_{t_0} + (\hat{\pi} - \pi^*)(t - t_0)$$

This basically means that the central bank commits itself to buy and sell unlimited amounts of foreign currency at the exchange rate \bar{s}_t , with the initial target after the devaluation, \bar{s}_{t_0} , chosen such that there is real depreciation of the domestic currency relative to the steady state,

$$[2.8] \quad q_0 \equiv p_{t_0}^* + \bar{s}_{t_0} - p_{t_0} > q$$

The exchange-rate target then corresponds to a nominal depreciation of the domestic currency equal to the rate of the difference between domestic and foreign inflation.

3) An exit strategy to a floating exchange rate and price-level targeting when the latter has been reached, with the following period loss function:

$$[2.9] \quad L_t = \frac{1}{2} [(p_t - \hat{p}_t)^2 + \lambda_{y_t}^2]$$

Or a flexible inflation-targeting with the same inflation target, with the following loss function:

$$[2.10] \quad L_t = (\pi_t - \hat{\pi}_t)^2 + \lambda_{y_t}^2$$

To sum everything up, the foolproof way is consisted of: a price-level target path; devaluation with the currency with its pegging to a crawling exchange rate target; and, once the price-level target path has been reached, abandoning the peg in favor of a flexible price-level targeting with the same target path or a flexible inflation-targeting with the same inflation target.

What this theory adds is, apart from the more formal proposal, the way how the policies are transmitted to the real economy. Its focus is on how to get the negative real interest rate and currency devaluation. Negative real interest rate, as we've seen previously, is necessary to close the output gap and a weaker currency might help.

2.3. Fiscal Policies

There are different views on the literature about the effects of fiscal policies in a liquidity trap. Under the monetary framework presented before, fiscal policies do little to create the inflation expectations necessary to push down the real rate of interest (Svensson 2006). The Japanese case seems to be a proof of the inefficacy of the fiscal policies in taking a country out of the liquidity trap (Krugman, 1998; Svensson, 2006).

DeLong and Summers (2012), on the other hand, discuss the efficacy of fiscal policy in severely depressed economies. Their main argument is that monetary policies in a severely depressed economy that already reached the lower bound have a rather questionable effect. Fiscal policies, on the other hand, can be extremely useful as a stabilization tool. This happens as a consequence of the state of the fiscal multiplier and the hysteresis effects. The fact that the economy is in

the lower bound greatly increases the fiscal multiplier even in the presence of low hysteresis effects. In fact, it might even reduce long-run debt financing burdens.

One criticism of mine to this argument is that the argument of the authors is based on the assumption that an expansionary fiscal policy will raise inflation expectations, which, as a consequence, will raise actual inflation and lower real interest rates. As stated before, that's quite unlikely to be achieved by just discretionary fiscal expansions, which means that the fiscal multiplier might be actually much lower than expected by the authors. In this case, fiscal expansions might be far from the expected size, only adding up to the debt burden.

The bottom line of this discussion is that, to get out of a liquidity trap situation through fiscal policies, a really big one time temporary fiscal stimulus is necessary. But "it is not enough for the fiscal policy to produce growth, but it must also lead to large increases in private demand, so large that the economy begins a self-sustaining process of recovery that can continue without further stimulus" (Krugman, 2000). Missing the amount of public stimulus might just end adding up to public debt, which will be a problem when the rate of interest turns positive (latest news on Japan confirm this problem).

Expectations and optimism are thus the key for the success of fiscal policies.

2.4. Conclusions

In this section we had a look into possible policies to be pursued when the nominal interest rate has reached the zero bound. Most of the mechanisms discussed here focus on the monetary policies possibilities rather than fiscal policies. Fiscal policies will be discussed more in depth in the next chapter, when potential non-Keynesian effects of fiscal policies will be considered. Such effects arise from high indebtedness levels (not considered normally by the classic liquidity trap studies), which is the focus of this thesis.

From the theories seen here, Svensson (2000) Foolproof Way was given the most attention, as it combines the effects of inflation expectation, advocated by Krugman (1998) and also currency devaluation effects, as an effective way of stimulating the economy. Also relevant is the analysis of quantitative easing and the ways it can affect the ways to reach inflation goal. In fact, all theories are rather complimentary and, as states Krugman (2000), in a liquidity trap, a country should try a combination of everything.

Chapter III: Debt, Fiscal Policy and the Austerians

3.1. Introduction

Going out of the liquidity trap framework for a moment, I now discuss the effects of sovereign debt in fiscal policies (I shall refer to it as just debt, in order to keep it simple). Debt has become an extremely big problem for the advanced economies in the post crisis scenario (figure 3.1), with several countries, including the United States, crossing the 100% gross debt threshold and continuously increasing their debt levels. Figure 3.2 shows the most indebted advanced economies. We can see that Japan, for example, has an indebtedness level of almost 250% of GDP and so do the Euro countries that have been facing the biggest problems lately (Italy, Ireland, Portugal and Greece).

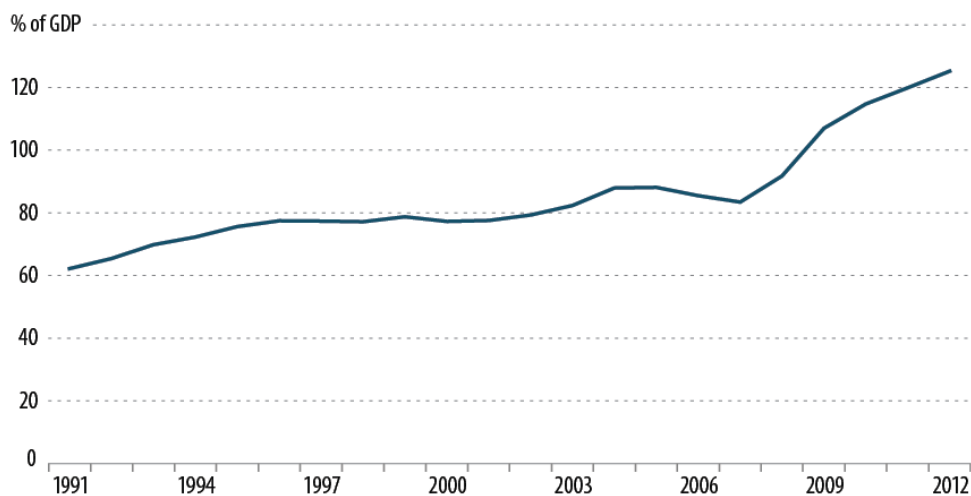


Figure 3.1. Average gross debt in G7 economies; Source: IMF World Economic Outlook, October 2012

Even though most of the standard models put debt aside, it is a fact that high government indebtedness is not a pleasant place to be. That is a consequence of either the burden that interest payments constrain the country to pay, to investment fear that the economy will suffer tax increases (Bertola and Drazen,

1991) or, most importantly, to the possibility that a country might actually default in its debt.

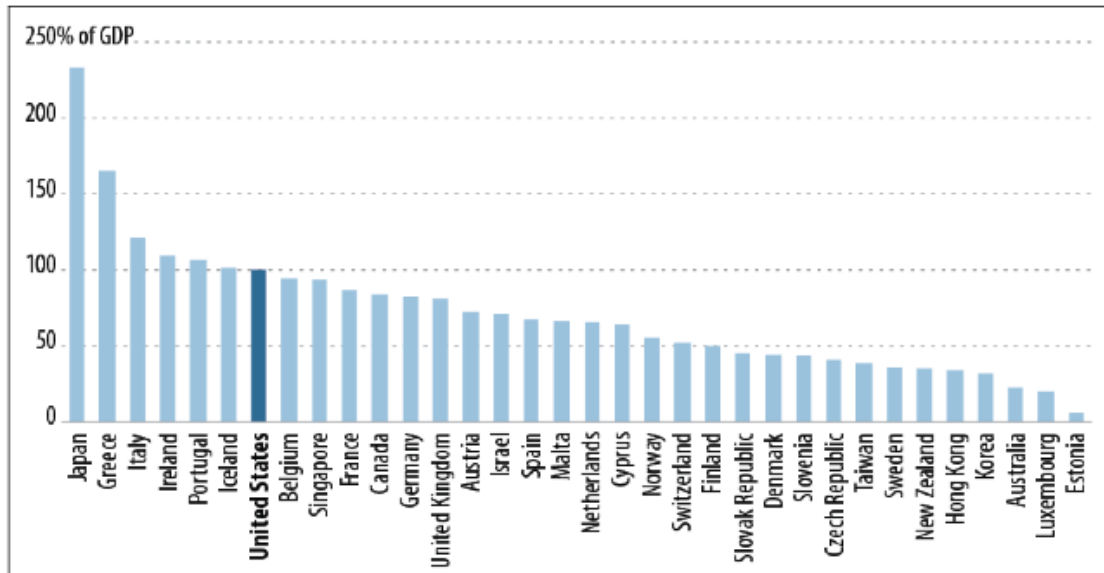


Figure 3.2. Debt over GDP for OECD countries Source: Nelson (2013)

Following Greece's debt issues and its debt restructure, fearing contagion, most advanced economies decided to seriously consider (and actually implement) austerity measures. In this chapter I'll analyze the literature on the debt disease and the austerity measures that follow.

It is important to point out though, that the debt problem is different for each economy. To some it is connected to risk (such as Spain, Portugal and Ireland), to others it is connected to political unrest about a high debt rate (such as the US and the UK). The difference among both problems is reflected in the interest rate paid by each, the spread.

3.2. Debt

Nelson (2013) in a paper written for the Congress of United States explains in a quite good and orderly way what sovereign debt really is. In this topic I'll sum up what the author pointed as the main dangers and main solutions to the high levels of debt problem.

The main issues that come from high levels of debt are vulnerability to unexpected and quick changes in investor behaviour, crowding out and a reduced capacity to respond to unexpected crisis.

Vulnerability to unexpected and quick changes in investor behavior

The first problem arises when investors begin to fear that a country might default in its existing debt. In such a situation investors can begin to ask for higher and higher interest rates which will just make the country's debt situation even more unsustainable than it previously was and might end up in a self-fulfilling prophecy with either default or a large scale austerity program, which can be quite damaging for the economy.

Crowding out

The second problem arises when the economy is in full employment and government's deficit is too high. In such a situation, the government can be competing with private investors for funds, which will push interest rates up and lead to a decrease in the latter. This point will also be further explored later on.

Reduced capacity to respond to unexpected crisis

The third problem is related to the capability of the government to make front to sudden crisis, such as natural catastrophes or financial crisis. In the face of one of these events, the government will be forced to act with stimulus but, if there's no space for such, it might end up in a debt situation even worse than before. If the deterioration is too big, it might lose investor's confidence and face a debt crisis.

The bottom line of this discussion is that debt is a significant variable in considering an economy's health. Naturally, high debt levels are not a good sign. Rogoff and Reinhart (2010), for example, even proposed an upper limit over which a country's growth begins to fade. A recent paper by Herndon, Ash and Pollin (2013) however, proved that the impact was not as significant as the previous

authors had predicted. Rogoff and Reinhart in fact estimated that countries over 90% of debt to GDP indebtedness would have a growth level of, on average, -0.1% of GDP. This was corrected to 2.4% by the three other authors mentioned. Still, a negative correlation between debt levels and growth was found, even though the cause consequence relationship is not well established. In fact, one relation that can be thought is that low levels of growth can induce countries to borrow more, increasing their levels of growth, while high growth countries will have more fiscal space to repay debt. On the other hand, several papers defend negative problems that arise from high debt level, as we will see in this chapter.

To solve the problem of debt there are five major policy tools that can be pursued: fiscal consolidation, debt restructuring, inflation, growth and financial repression.

Fiscal consolidation

Fiscal consolidation is what is usually known as austerity. It consists in the use of tax increases and government spending cuts with the goal of reducing the government deficit up to a certain level. A more in depth discussion of this policy tool will follow in the next topic.

Debt restructuring

Debt restructuring means, more or less, partial default. By asking investors to redefine the terms in which the debt was set, such as extended time for repayment or lower interest rates, a country can restructure its debt, allowing itself to manage better with debt payments by paying less than it had promised before.

The positive point of this measure is that it avoids the painful consequences of austerity. In this way no big tax hikes or spending cuts, which can hurt aggregate demand in the short term, will take place. On the other hand, after such a measure, a country might find itself having troubles in borrowing from capital markets and also it might damage itself in any case, being the debt mostly owned domestically.

Inflation

A country that has its debt mostly denominated in the domestic currency can use inflation to reduce the real value of the debt. This type of policy involves basically a fiscal-monetary collaboration, with the monetary authority creating money to repay the country's creditors or through some other channels.

This policy has to be unexpected to investors otherwise these will want to protect themselves against inflation by asking even higher interest rates. Adverse consequences of inflation may be a decrease in the real value of savings, a shortage of goods, and a reduction in current investments given uncertainty in the economy.

Growth

When a country grows, it can decrease the rate of debt to GDP provided that it won't increase the debt more than it grew. This implies that growing is a good way of getting out of debt provided that government expenditure won't grow accordingly. In this case, bigger tax revenues can be used to cut down debt levels.

In order to grow, a country with low growth level, can either pursue expansionary fiscal and monetary policies or pursue structural reforms such as making the labour market more flexible, privatizing state-owned enterprises, and liberalizing trade policies.

Financial Repression

Financial repression is an instrument that requires a great deal of capital controls by the government. It consists in making it mandatory for domestic investors to buy government bonds at artificially low interest rates. When the economy's real interest rates become negative (due to inflation) we will be able to see a falling debt to GDP over time.

3.3. Debt and Fiscal Policies

Debt influences fiscal policies in the sense that it works as an upper bound into which expansionary fiscal policies can be extended. As we have seen in the previous topic, when debt is perceived to be too high, investors might begin to raise questions about its sustainability. The main indicator used when assessing the impact of a fiscal policy is the fiscal multiplier, which can be negatively influenced by either Keynesian effects (crowding out) or non-Keynesian effects (Ricardian equivalence).

3.3.1. Crowding out

Crowding out is a possible by-product of extended Keynesian models (price rigidity and excess capacity, so that output is determined by aggregate demand being the basic) in which a fiscal expansion can lead to an increase in interest rates or an appreciation of the exchange rate that will lead to a decrease in investments (Hemming, Kell and Mahfouz, 2002).

Simplifying the authors literature review even further, the factors that influence the existence and impact of crowding out are mainly four:

The determinants of private investments

Investment can be sensitive to interest rates or to current income. If its sensitivity is greater to the first, crowding out is more likely to be larger. If it is greater to the later, crowding out won't be such an issue, even though it still might be present. Given

$$[3.1] \quad I = \alpha f(i) + \beta f(Y)$$

Where α is the sensitivity to interest rate I and β is the sensitivity to current income Y . In this case, if $\alpha > \beta$ – crowding out is greater, and vice versa.

Money demand and monetary policy

The less sensitive money demand is to interest rates, and the more sensitive it is to income, the more crowding out there will be. Given Keynes'

$$[3.2] \quad M = \alpha M_1(Y, P) + \beta M_2(\varphi, i)$$

If $\alpha > \beta$ – crowding out will be greater, and vice versa.

Openness and the exchange rate regime

The following table describes the influence of the openness and the exchange rate regime in crowding out

Crowding Out in Open Economy		Exchange Rate	
		Flexible	Fixed
Capital Mobility	Lower	If 0 CM - same as closed economy	Lower than closed economy
	Perfect	Complete crowding out	No crowding out

Table 3.1. Crowding out in an open economy

Crowding out in a closed economy was taken as the benchmark for evaluating crowding out in an open economy. We can consider crowding out in a closed economy to be influenced by the two previous factors and the one below.

Price flexibility

In a closed economy, fiscal expansion in a price flexibility scenario will lead to higher prices. Higher prices will lead to a smaller aggregate demand increase, which means a smaller fiscal multiplier. Crowding out is thus reinforced.

In an open economy again we will see two scenarios:

- With a flexible exchange rate, crowding out depends on how correlated are changes in domestic prices to changes in the exchange rate (the higher the correlation, the lower the crowding out).

- With fixed exchange rate, current account will deteriorate with higher prices (and consequently, an appreciation of the real exchange rate) and there will be more crowding out than with price rigidity;

Two other important effects are: wealth effect and dynamic effects. The first is connected to how much consumption depends on wealth and how much wealth will decrease with higher prices. The second is connected to the time frame of crowding out as the longer it takes for crowding out to manifest, the higher will be the short term fiscal multiplier.

3.3.2. Non-Keynesian effects of Fiscal Expansions

Non-Keynesian effects of fiscal expansions are based on new classical models that work mainly through rational expectations. The basic proposition is that, given forward looking consumer behavior with rational expectations, there can be situations in which Ricardian equivalence will hold and the fiscal multiplier will turn negative (Hemming, Kell and Mahfouz, 2002).

The authors, again making an assessment of the literature up to that date on the subject of fiscal policies, discuss five features through which new classical models can affect fiscal multipliers and thus the effectiveness of fiscal policies:

Rational expectations

Rational expectations bring forward adjustments in variables to the present faster than adaptive expectations. This means that long-term effects of fiscal policies matter more in the short-term than adaptive expectations models. Lucas (1986) makes the case for the fact that these are not necessarily contradicting theories, but that each one of them will hold in different occasions. Rational expectations thus are important when a policy or an external shock has seemingly permanent consequences over the long run (a permanent increase in government expenditure can have a negative fiscal multiplier due to crowding out because interest rates are expected to become persistently on the upper level).

Ricardian equivalence

Ricardian equivalence basically means that, when consumers are forward-looking and fully aware of the government inter-temporal budget, a fiscal expansion is likely to be irrelevant (fiscal multiplier is zero) because lower taxes now mean higher taxes in the future. In such a scenario, consumers will save the extra income. This theory is the one that connects taxes with debt.

In a Ricardian equivalence framework, in which consumers take into consideration the future expected tax levels in their consuming decisions, Sutherland (1997) for example shows that the power of fiscal policies depends on the amount of public debt. When public debt is moderate consumers discount future taxes because they expect future generations to have to pay for it and the fiscal expansions have the usual Keynesian effect. But when debt reaches extreme values consumers expect a debt stabilization program soon and thus expect to face high taxes for quite a long time. When this happens, fiscal expansions are contractionary.

Working in a similar fashion, Bertola and Drazen (1991) show that when the public expects that an increasing government spending will start to decrease, once a certain trigger point is reached, a non-linear relationship between private consumption and government spending will arise. The implication of this theory is that the effect of an increase in government spending may be expansionary if people believe that such policy is temporary and is likely to end soon. This will happen only if private agents believe that a fiscal expansion now will lead to a significant cut of taxes in the future.

Consumption smoothing

Mankiw (2000) criticizes the perfect consumption smoothing of the models of Barro-Ramsay (one person life-cycle) and Diamond-Samuelson (intergenerational), for the Ricardian equivalence, based on the fact that there are several consumers with zero net worth. He then proposes a partial consumption smoothing model based in a savers-spenders model in which savers are people with

higher net-worth that are likely to be in the Ricardian equivalence framework (and thus worry with intergenerational tax burdens) and spenders are people that live paycheck to paycheck. From his proposed model, five propositions arise:

- Temporary tax changes have large effects on the demand of goods and services
- Government debt need not crowd out capital in the long run
- Government debt increases steady-state inequality
- Substantial long-run crowding out can occur if taxes are distortionary
- The optimal steady state capital tax from spenders' standpoint is zero

Interest rate premia and credibility

The idea behind interest rate premia and credibility is that, when government debt gets to levels in which markets question its sustainability, investors will begin asking for a higher interest rate as a way of compensating the risk of default. A higher interest rate then may crowd out investments in the short run. In this case, as Hemming et al. (2002) pointed, policy credibility is crucial, and temporary fiscal expansion will be more effective than a permanent one. It is important to notice that, in an open economy, such risks may completely crowd out foreign investments, which will try to avoid the exposure to the country's economic risk.

Uncertainty

As in the case of foreign investments, if a fiscal expansion is associated with a bigger uncertainty, households and firms will take precautions with the possibility of harsher times, which will reduce the fiscal multiplier, or even turn it negative.

Sum up

To sum everything up, the new Classical models state that, given certain economic conditions, the fiscal multiplier is likely to be less than zero. In such situations a fiscal expansion is likely to have non-Keynesian effects, which means

that it will end up either doing nothing at all or even contracting the economy. The fact that the multiplier is negative for expansions does not necessarily imply that it is also negative for contractions, though. This happens because the conditions for negative signals usually do not hold when the direction of fiscal policies is opposite.

3.4. Supply-side effects of fiscal policies

Even though supply-side effects are not so important when an economy is in a liquidity trap, coming back once again to the work of Hemming et al. (2002), we can make the case for the fact that how government spends its money is as important as how much it spends, in other words, if changes in expenditure affect productivity of labor and capital.

This results from the fact that some government expenditures can have more positive externalities than others and focusing on the ones with higher externalities in detriment of the others can be a good way of increasing growth when total government expenditures cannot be further increased as Murphy, Shleifer and Vishny (1989) model for industrialization shows.

3.5. Austerity

Austerity as a policy is something quite hard to define. It takes hold in the previously mentioned Keynesian and non-Keynesian notions to advocate for fiscal contractions. The (critical in its essence) description of Blyth (2013) can help us understand:

“Austerity is a form of voluntary deflation in which the economy adjusts through the reduction of wages, prices, and public spending to restore competitiveness, which is (supposedly) best achieved by cutting the state’s budget, debts and deficits. Doing so, its advocates believe, will inspire

‘business confidence’ since the government will neither be ‘crowding-out’ market for investment by sucking up all the available capital through the issuance of debt, nor adding to the nation’s already ‘too big’ debt.”(p.02)

From this description we can conclude that austerity arises from non-Keynesian effects of fiscal policies and can be both supply-side (labour) and demand-side non-Keynesian and Keynesian (business confidence and crowding out). It defends a fiscal contraction as a way of growth by improving private investment (Alesina et al. 2002) and reducing debt (Alesina and Ardagna, 2012). The consequences of such contraction are most likely to be recessions in the short run with expansion and growth coming in the medium to long run.

Alesina and Ardagna (2002) offer us a good way to understand austerity from the supply side. When a government pushes up public spending, it increases labour cost and consequently reduces companies’ profits. Basing on the idea that profits play a central role in determining the amount of investments, the consequence of a fiscal expansion is thus, a decrease in profits (which is higher when the expansion leads to an increase in the government wage bill). Tax increases also reduce profits and investments, being the biggest effects when taxes are directed to the labour market. On the other hand, the authors claim nothing special happens to investments in the presence of large fiscal adjustments.

Bertola and Drazen (1991) and Sutherland (1997) demand-side models deals with consumers’ expectations on the sustainability of government expenditures. In Giavazzi and Pagano (1990) we can see two examples, Ireland and Denmark, during the 1980s, of rising consumer confidence after a fiscal contraction. The graph of figure 3.3 shows consumers’ expectation following a fiscal contraction for Denmark (in 1983).

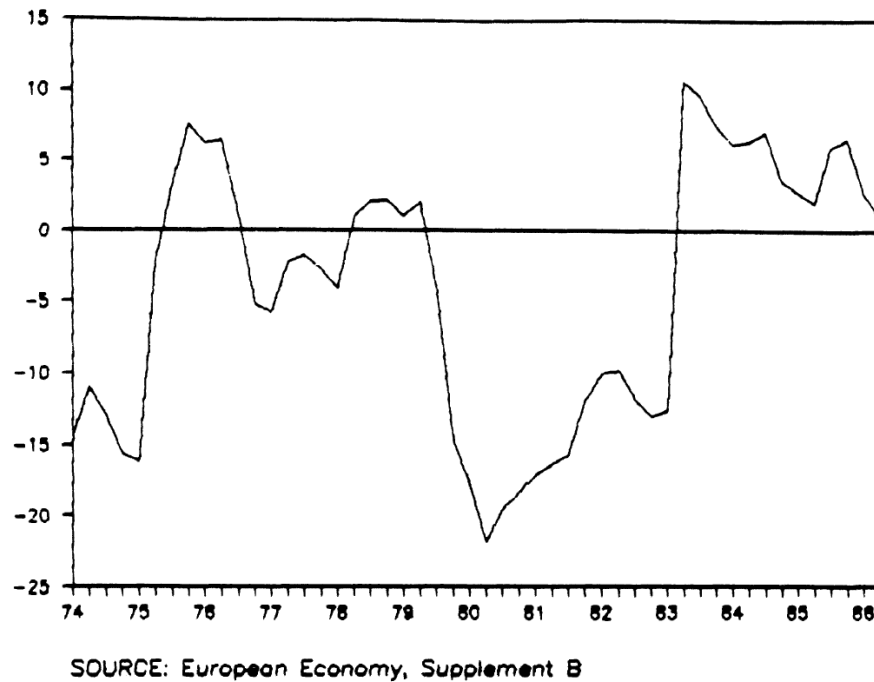


Figure 3.3. Denmark – Index of consumers' confidence; Giavazzi and Pagano (1990)

An important conclusion of all previous cited works is that budget cuts are much less recessionary than tax increases.

3.6. The criticism to austerity

Anyone that has been keeping track on the debate between pro and against austerity lately knows that the policies debated here are nowhere near widely accepted. Krugman makes the case for the usual causal relationship between debt and growth pointed out by Rogoff and Reinhart (2010). Even though he acknowledges that higher and higher debt seems to be connected to lower growth, he points that this does not mean that reducing debt will have any effect whatsoever.

Many authors (including some of the ones that advocate austerity) have also pointed out the fact that most of the cases in which budget balancing was effective

as a way of increasing growth in the short term, it was connected to the monetary authority lowering interest rates as a way of counteracting a lower fiscal spending.

Blyth (2013) is strong in making a case against austerity, pointing out that in many occasions in the past it was a failed policy. Examples of that are the policies pursued after the end of the gold standard that pushed countries into deeper recessions or the mistake of 1937, when President Roosevelt pushed for a contraction in the fiscal policy (together with a tightening in monetary policy from the Fed). The result was also a really strong recession.

My opinion on this matter is that, as Summers claims in his blog (Summers, 2013) austerity policies do make sense, but just when the economy is constrained in the supply-side and government is clearly crowding out private investment as seen before. In this situation, it is better for the government to decrease its presence and allow for private investments to “crowd in”. In a Keynesian environment, when the output is determined by aggregate demand and the economy is depressed, the supply-side is unlikely to be constrained.

Leigh et al. (2010) offer a good structured critic analysis on fiscal consolidations, making the case against the short term benefits that some authors such as Alesina and Ardagna defend. These authors point out that a fiscal consolidation normally reduces output and raises unemployment in the short term. These effects can be offset by easier monetary policies and a rise in net exports. When these conditions are not present, and when budget deficit cuts are done by several countries at the same time, fiscal contractions are likely to be more painful⁵. Though, the authors agree that, on the long term, reducing government debt is likely to raise output as interest rates decline. Also that fiscal consolidation is less costly when there's risk of sovereign default.

⁵ This is important for today's situation, as many countries seek to pursue austerity measures simultaneously.

3.7. Conclusion

In this chapter we had a look in the debt problem its consequences and its effects in fiscal policies. Policies that take in consideration debt and seek to reduce it are called austerity policies.

One thing that we can take from the debt problem discussion is the fact that a high level of debt impairs a country's ability to respond to a crisis. This is extremely relevant⁶ to a liquidity trap scenario. In fact, as it will be further discussed in the next chapter, a liquidity trap is the result of a big crisis, or a Minsky Moment, in which fiscal response, even though with inconclusive results, helps a lot. Not being able to use stimulus freely is certainly an issue which might worsen the crisis.

Crowding out, even though not strictly connected to the debt problem, was analyzed as an important factor in the Keynesian fiscal policy. This is not likely to influence a country which is in a liquidity trap, for, in a liquidity trap, investments are sensitive to consumption (expected) and the demand for money will meet the preference for liquidity.

The conclusion is not the same for non-Keynesian effects on fiscal policies. In fact, in a highly indebted country it can be expected that the problem of interest rate premia and market credibility and the problem of uncertainty will both have a big importance. Ricardian equivalence is a more complicated topic but some authors argue for the fact that, in a liquidity trap situation, it does not hold (Krugman, 1998 and McCulley, 2013, for example). Fiscal policy than might not influence private consumption via spending but via expectations of both taxes and financial stability.

Mankiw (2000), which proposes a rather balanced model, with both Keynesian and Neo-Classical consequences, gives us an important relationship, which is that temporary fiscal policies have a relevant impact in the short run for the demand of goods and services.

⁶ Even though *ex-post* nothing can be done in respect to this.

From what was seen it is my belief also that the policies of austerity can be a valuable tool when there is space for growth and monetary policies. In a liquidity trap the situation is rather different. Monetary policy is no longer available in such situation and the problem is no longer mounting inflation or rising interest rates. On the contrary, as seen in the previous chapter, in a liquidity trap we will most likely see deflationary pressures and falling interest rates.

A more adequate policy in such situation (and the one defended by this thesis) could be to deal with debt sustainability expectations using rational expectations. This way, if a country can credibly commit to keep its debt levels under control in the future (let's say, by promising to undergo austerity a certain number of years from now) and thus, assure investors of their best intentions in doing it, it will have a bigger flexibility to use stimulus in the present, but this will be seen in a later chapter.

Chapter IV: Leveraging Cycles and Debt-Deflation

4.1. Introduction

In the previous chapters we saw what the liquidity trap is and how to get out of it and also issues related to the debt problem. In this chapter I'll bring two theories that might connect both issues: the leveraging cycles theory of John Geanakoplos (Geanakoplos, 2009; Geanakoplos, 2010) and the debt-deflation theory of great depressions first built by Irvin Fisher and later given a modern look by Krugman and Eggertsson (Fisher, 1933; Krugman and Eggertsson, 2012). The connecting framework will be laid by the work of Paul McCulley (McCulley, 2013).

4.2. The Leverage Cycle

Geanakoplos (2009, 2010) explains what the author called, the leverage cycle. His theory is based in a different way of understanding asset pricing, based not only on interest rates, but also on collaterals. The importance of his work in the current discussion is that it gives finance and macroeconomics a connection that goes beyond the price level of assets and also helps us understand how great crisis came to happen from an asset price, collateral and leverage point of view.

The collateral rate is a measure of how much of the value of an asset an investor has to give as backing to get a loan to buy the asset. This, according to the author, is the fundamental variable of leverage cycles as it defines the amount of credit that can be (and is being) taken. The higher the leverage (and lower the collateral), the higher the systemic risk as well. This happens because, when asset prices are mostly rising, with a high leverage return is bigger than normal. But when the market shifts and the economy face a downturn, losses will also be much bigger, putting the whole system at risk. Having this in mind, we can say that

collateral rates “reflect the perceived volatility of asset prices and the resulting uncertainty of lenders” (Geanakoplos, 2010). In a time of crisis, the collateral rate becomes much more important than the interest rate.

For the collateral to go up and down there must be heterogeneity of investors. Heterogeneity of investors for Geanakoplos means that investors are usually divided between pessimistic and optimistic. This is not an absolute measure though. What happens is that investors are dispersed between the two extremes, purely optimistic and purely pessimistic, as shown by the figure 4.1 below. The more optimistic, the more a natural buyer the agent is. The more pessimistic, the more likely the agent is to sell or lend the asset. In Geanakoplos model the agents are assumed to be in a continuous between the extremes.

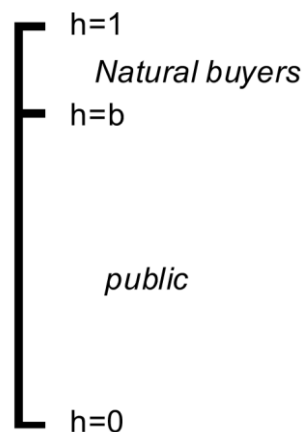


Figure 4.1. Optimistic agents ($h=1$), pessimistic agents ($h=0$) and their division ($h=b$);
Source: Geanakoplos (2010)

This division then is what determines if an investor will buy an asset or sell it. Those who are natural buyers will push prices of assets up, and those who are natural sellers down; and in a normal situation there will be an equilibrium between buyers and sellers that allow for the price to remain stable. But at an increased leverage, optimists will be able to, alone, push the prices up in a higher proportion than pessimists will be able to push the prices down. This happens because they can, with less personal money and more debt, keep on buying assets they believe will keep on growing. The consequence is that prices will keep on

rising even if the number of optimistic buyers decreases, because the higher the leverage, the smaller the number of buyers at the top required to buy all assets.

In other words, with low margins (ratio of money spent to value of asset purchased) optimists can keep on pushing the price of houses up by generating more and more demand (when the margin is, say, 3%, it takes only 150 billion dollars to buy 5 trillion dollars of assets, putting those assets as collaterals for the loan).

But the leverage cycle is also influenced by good news and bad news. When good news is received, optimism increases and asset prices go up and that might reinforce optimists and push the leverage up. When bad news is received, the opposite happens. In neither occasions the margin varies drastically.

So how can leverage increase so much? Declining margins over an extended period of time such as the ones that allow for optimists to “dominate” happens when the economy is in a time of happy news and no dangers in the horizon. This reasoning explains why, on the burst of the last financial crisis, both homeowners and banks were so leveraged, as the years before the crisis were calm and prosperous ones.

But what happens to generate a crisis and a sharp rise on margins is not only bad news, but “scary” bad news. Scary bad news leads not only to a change of asset prices, but also to its volatility. To make a long story short, they raise questions about the future state of things. The consequence is that, in the face of the unknown, investors will want to lower the risk of facing big losses and for that they will begin to increase their margins to lower potential losses. In other words, they will begin to deleverage. But their deleveraging will bring prices of assets down. Lower asset prices will incur big losses in optimistic investors that will either deleverage more, or go bankrupt. More deleveraging will make the price of assets to an even lower point and so forth.

The Liquidity Trap in a Debt Constrained Scenario

The graphic of figure 4.2 shows what happened in the current financial crisis. As we can see, the house prices are going up together with an increased leverage in the economy.

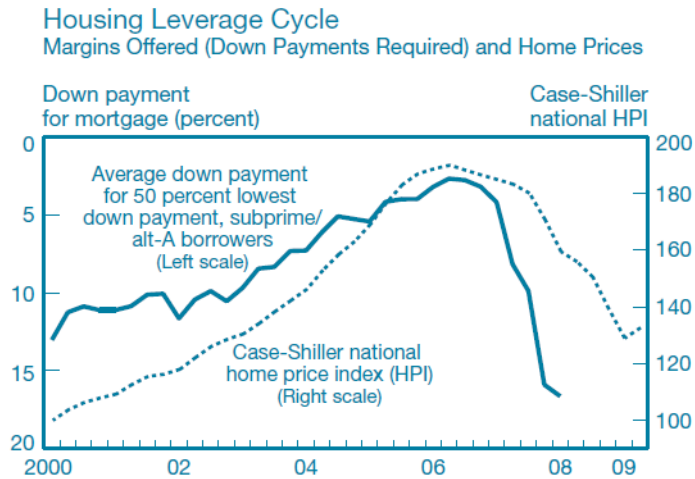


Figure 4.2. The Housing Leverage Cycle; Source: Geanakoplos (2010b)

The “scary” bad news came with problems in the increase of delinquencies by the second quarter of 2006. As we can see, that’s when house prices began to turn and volatility (figure 4.3) began to rise.

VIX Index

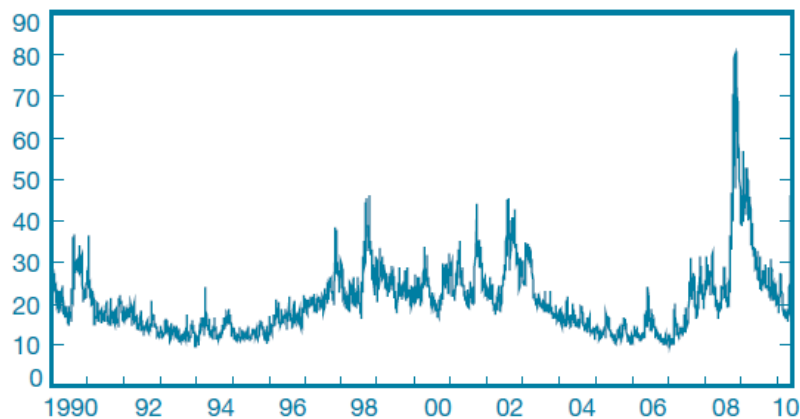


Figure 4.3. Volatility in the housing market; Source: Geanakoplos (2010)

The mechanism explained previously then entered into play and the marginal buyers, the ones that were pushing prices up, began to change opinion on the current state of things. In addition to the shift in opinions, there was an increase (figure 4.4) in the number of standardized credit swaps, which is basically an insurance against the default of bonds. CDS is a way pessimists have of protecting themselves against downturns, but has also the effect of pushing prices down, as allows pessimists to express their views on the market.

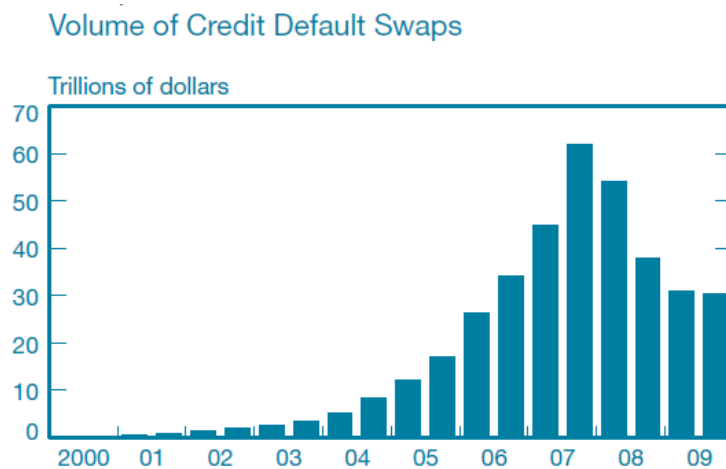


Figure 4.4. Volume of CDSs (Credit Default Swaps); Source: Geanakoplos (2010)

The leverage cycle then ends with: first, bad news that create uncertainty and disagreement; second, sharply increasing collateral rates; and third, losses and bankruptcies among the leverage optimists. To a crisis like this, Geanakoplos proposes a three step solution: First step: Addressing the precipitating cause of the crisis: “scary” bad news (massive uncertainty) about housing and the assets build on housing. This step is divided in: saving the homeowners and putting a floor to housing prices; and restarting private lending on mortgages; Second step: A Fed lending facility to help restore reasonable leverage; Third step: Restoring “optimistic” capital

4.3. Debt Deflation

4.3.1. Fisher

Fisher (1933) can be traced as the genesis of Geanakoplos ideas. As Geanakoplos, Fisher also states that over-capacity, under-consumption, price-disallocation, etc⁷, are not good in explaining big disturbances.

In his theory, there are two main factors that define great depressions: over-indebtedness and deflation. Over-indebtedness happens when money is too easy and new opportunities to invest at a big prospective profit are great. But it comes a point in which the markets crash and the burst of a boom leads people to reduce their debt level. The more the economy is driven into a paying debt mode, the smaller the consumption is. This lowers the demand and what follows is a lowering in the price of goods, in other words, deflation.

The deflation, if bigger than the payment of debts (which is usually the case), actually increases the overall indebtedness. This, as it follows, leads to people being more indebted and paying (relatively) more debts and prices decreasing even more. This is the debt-deflation spiral. The conclusion is that “the mass effort to get out of debt sinks us more deeply into debt” as Fisher says.

4.3.2. A modern look

Eggertsson and Krugman (2012) extend the work of Fisher giving it a modern development based on a New Keynesian approach. They base themselves in Krugman (1998) and develop a two consumer model in which one is “patient” (saver) and the other one is “impatient” (borrower).

The theory developed, in a first phase, assumes we are in a pure endowment economy in which all production is consumed and no aggregate saving or investments is possible, but in which agents can lend or borrow from each other according to their utility function.

⁷ We can think of these small disturbances in the short-run equilibrium as generators of good and bad news.

$$[4.1] \quad \sum_{t=0}^{\infty} \beta(i)^t \log C_t(i) \quad \text{with } i = s \text{ or } b$$

Where “s” stands for spender and “b” stands for borrower. $\beta(s) > \beta(b)$ and $\beta = 1/(1+r)$ is a parameter that explains the opportunity cost of the consumption in relation to the saving. We see that Saver has a β higher than the Borrower, that is, for the same form of the utility function, the saver consumes less than the borrower. Each one receives an endowment of $Y/2$ and they are constrained by the following equation.

$$[4.2] \quad Y = C_s + C_b$$

Y = Endowment; C_s = consumption of the “saver” agent; C_b = consumption of the “borrower” agent.

This model is based on consumers borrowing and lending in a risk-free bonds market denominated in the consumption good, which is just one. There is an exogenous limit for the amount of debt that can be contracted by the borrower though. This exogenous limit in a first moment has a value which we will call D_{high} . With $D_t(i)$ being the amount of debt of the agent at a given t time and r_t being the interest rate on debt, the budget constraint of each agent is:

$$[4.3] \quad D_t(i) = (1 + r_{t-1}) \cdot D_{t-1}(i) - 1/2 \cdot y + C_t(i)$$

with $C_t(i)$ = consumption of agent i in period t .

From these equations, we can derive the steady state, which is for the consumption of the borrower:

$$[4.4] \quad C_b = 1/2 \cdot Y - \frac{(r \cdot D_{high})}{(1+r)}$$

And the saver:

$$[4.5] \quad C_s = 1/2 \cdot Y + \frac{(r \cdot D_{high})}{(1+r)}$$

Deleveraging

But now, if the debt limit goes to a lower level D_{low} (as a consequence of a bubble in overpriced assets suddenly bursting – sometimes called the Minsky Moment), the borrower will have to deleverage to meet the new budget constraint. The long run consumption function of the borrower thus becomes:

$$[4.6] \quad CL_b = 1/2 \cdot Y - \frac{(r \cdot D_{low})}{(1+r)}$$

Being that in the short run he must repay D_{high} . This will lead us to a new budget constraint function.

$$[4.7] \quad D_s = D_{high} - 1/2 \cdot Y + CS_b$$

Considering that the borrower has to deleverage to the new debt limit within a single period, then $D_s = \frac{D_{low}}{(1+r_s)}$ his short run consumption function will be

$$[4.8] \quad CS_b = 1/2 \cdot Y + \frac{D_{low}}{(1+r_s)} - D_{high}$$

In a similar fashion, for the saver, in the long run, the new consumption function will be:

$$[4.9] \quad CL_s = 1/2 \cdot Y + \frac{(r \cdot D_{low})}{(1+r)}$$

Remembering that this is an endowment economy and both in the short run $Y = CS_s + CS_b$ then:

$$[4.10] \quad CS_s = 1/2 \cdot Y - \frac{D_{low}}{(1+r_s)} + D_{high}$$

Assuming that the optimal consumption decision of the saver follows the Euler consumption function, so that:

$$[4.11] \quad CL_s = (1 + r_s) \cdot \beta \cdot CS_s$$

Substituting the long run and the short run saver consumption in this equation we obtain a relation between the real natural interest rate (r_s –

endogenous) and the debt limit, considering Y fixed at the level of full employment:

$$[4.12] \quad 1 + r_s = \frac{1/2 \cdot Y + D_{low}}{(\beta \cdot 1/2 \cdot Y + \beta \cdot D_{high})}$$

Now, for a deleveraging shock to originate a liquidity trap, all we need is that the natural rate of interest r_s becomes negative. For that:

$$[4.13] \quad \frac{1/2 \cdot Y + D_{low}}{(\beta \cdot 1/2 \cdot Y + \beta \cdot D_{high})} < 0$$

Flexible prices

Until now we have considered prices to be fixed. With fixed prices (inflation $\pi = 0$) it's impossible to reach a real interest rate (equation below) lower than zero:

$$r = i - \pi$$

We know that the nominal interest (“ i ”) rate cannot be negative, so in a condition of large deleveraging shock we need a positive π to reach the negative natural interest rate. This implies that price level must drop now so that it can rise in the future, creating the necessary inflation. The result obtained in flexible price economy is that a deleveraging shock causes deflation in the short run.

From Fisher (1933) we know that, supposing that the debt is in nominal terms, a fall in the price level increase the real value of the existing debt. So deflation increases the burden of deleveraging. We define the nominal value of the debt as: B_{high} , then the real value of the short run repayments of the borrower is:

$$[4.14] \quad \frac{B_{high}}{P_s} - \frac{D_{low}}{(1+r_s)}$$

Hence as the price level drops, he must pay more and the natural rate of interest becomes:

$$[4.15] \quad 1 + r_s = \frac{1/2 \cdot Y + D_{low}}{\beta \cdot 1/2 \cdot Y + \frac{\beta \cdot B_{high}}{P_s}}$$

This means that with flexible prices natural interest rate is now endogenous and, with a drop on price level, it becomes more negative, making the price level drop even more in the spiral of “Fisherian debt deflation”.

This up to now is the basic development of the author’s theory that shows the debt-deflation theory of Fisher giving it a modern face. I consider this part of theory developed to be the most useful part for the purpose of this work. Also important are the conclusions that emerge from its analysis.

Consequences

The first important development (at least until the part this study considered) of Krugman and Eggertsson (2012) was formalizing Fisher’s theory. The second one was clarifying, based on the theory, what Krugman himself had called the topsy-turvy economics which arises as a consequence of a liquidity trap. This emerges when the authors add an endogenous output – instead of receiving an endowment, as considered up to now; the agents receive their income as wage from goods produced by their labour – on the model developed previously.

To make a long story short, they find out that, in a liquidity trap, the AD curve is actually upward sloping, as shown in the picture below. This happens because a lower price level increases the real value of debt, which forces the borrowers to consume less. In the meanwhile, the lenders have no incentive to consume more, because the nominal interest rate is stuck at zero.

In fact, if we think about the textbook derivation of the AD-AS (Blanchard, 2006), the AD curve is downward sloping because a lower price level will cause an increase in the real supply of money having the same effect of a monetary expansion. But in a liquidity trap that does not really matter, as a monetary expansion will become unused liquidity instead. What shifts the AD to an upwards sloping AD than is the negative effect that rising real debt levels have on the

borrowers as, when prices lower, savers consumption and investment will not be stimulated and borrowers' consumption will decrease, lowering the output level.

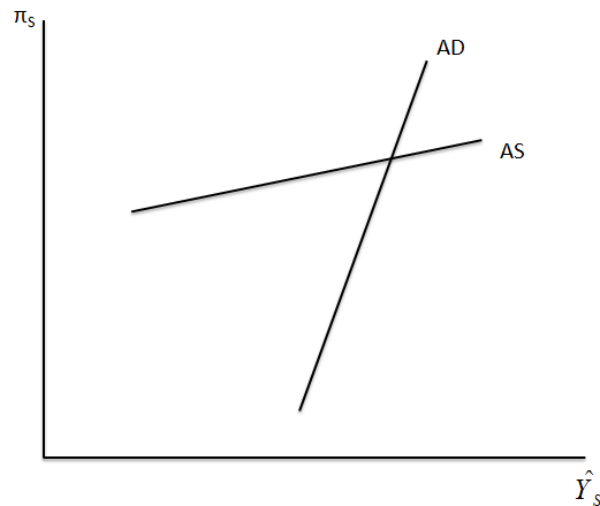


Figure 1 : Topsy-turvy economics

Figure 4.5. Topsy turvy economics; Source: Krugman and Eggertsson (2012)

Such a scenario helps us a lot in understanding the world of a liquidity trap, since it explains two of the paradoxes that come with it: the paradox of toil and the paradox of flexibility.

The paradox of toil (left-hand graph of figure 4.6) was first identified by Eggertsson. It describes the situation in which an economy, by increasing the aggregate supply (with a rise in productivity, for example), will actually lower it. This can be explained by this model: a shift of the AS to the right will actually lower the price levels (contrary to the normal effect in the classical model) and this will contract aggregate demand via Fisher effect.

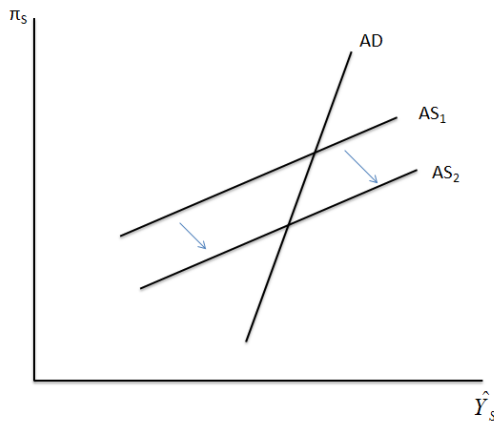


Figure 2: The paradox of toil

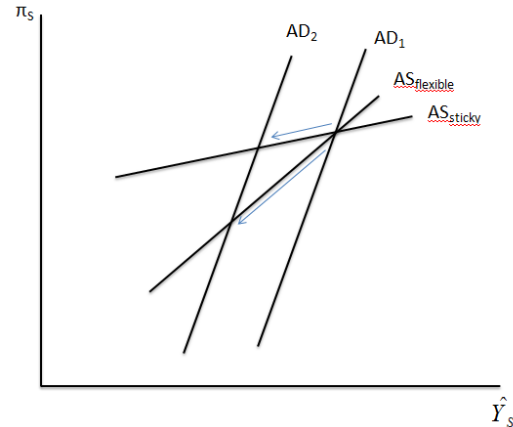


Figure 3: The paradox of flexibility

Figure 4.6. The paradox of toil and the paradox of flexibility Source: Krugman and Eggertsson (2012)

The paradox of flexibility (right-hand graph, figure 4.6) is another outcome of the liquidity trap: an increased labour flexibility, which is usually defended as a way of helping to minimize the losses of a demand shock, actually will make the effects of such shock worse. That happens because falling prices, which are usually the argument pro flexibility, actually just raise the value of debt, in a debt deflation way.

As we can see in the graph, AS_{sticky} represents an inflexible prices and wages world and AS_{flexible} represents a more responsive prices and wages. The shock (for example, the 2007-2008 financial crisis or the 1929 crisis) is represented by a shift in the AD from AD_1 to AD_2 . As we can see, in an economy with bigger price and wage flexibility, the output decline is much bigger in the flexible case than in the sticky one. This is also a result of the Fisher effect on consumption.

The paradox of thrift is also present in a liquidity trap. It was first described by Keynes and it emerges when, in a zero interest rate economy, a collective attempt to save will simply depress the economy, which will bring lower investments and lower savings. This model cannot reproduce it though.

In what concerns monetary and fiscal policies, Krugman and Eggertsson add some interesting thoughts as well. In monetary policy it is defended that not

just a complete expansion (that reduces the real interest rate up to the point it can restore full employment) but also an incomplete expansion, that is one that reduces the real interest rate but not enough to restore full employment, is good for the economy. In fact it leads to a higher price level and therefore to a lower real debt burden.

In fiscal policy the authors defend that the fiscal multiplier is at least 1 (depending on the conditions in which the economy is found) and that Ricardian equivalence does not hold. Being that so, as borrowers are demand constrained the government should proceed with fiscal policies as long as the economy is in a deleveraging mode.

Moreover, since debtors are liquidity constrained, their spending depends on their margin on current income and not on their expected future income. Government spending is seen as purchases of the same composite good consumed by individuals, but it doesn't substitute private spending, it compensates the fall in the borrower consumption.

The conclusion is that implementing expansionary fiscal policies helps the economy (especially if already in the beginning of the crisis) to maintain its optimal level of output, preventing the Fisherian debt deflation cycle to begin.

4.4. McCulley framework

McCulley (2013) puts together the theories of the leverage cycle, the liquidity trap and crowding out effects by emphasizing the balance sheet analysis. As consequence, the author sums up the causes and consequences of fiscal and monetary policy when an economy is either in a leveraging or in a deleveraging situation and builds an interesting framework that maps what happens in the different cases.

The Liquidity Trap in a Debt Constrained Scenario

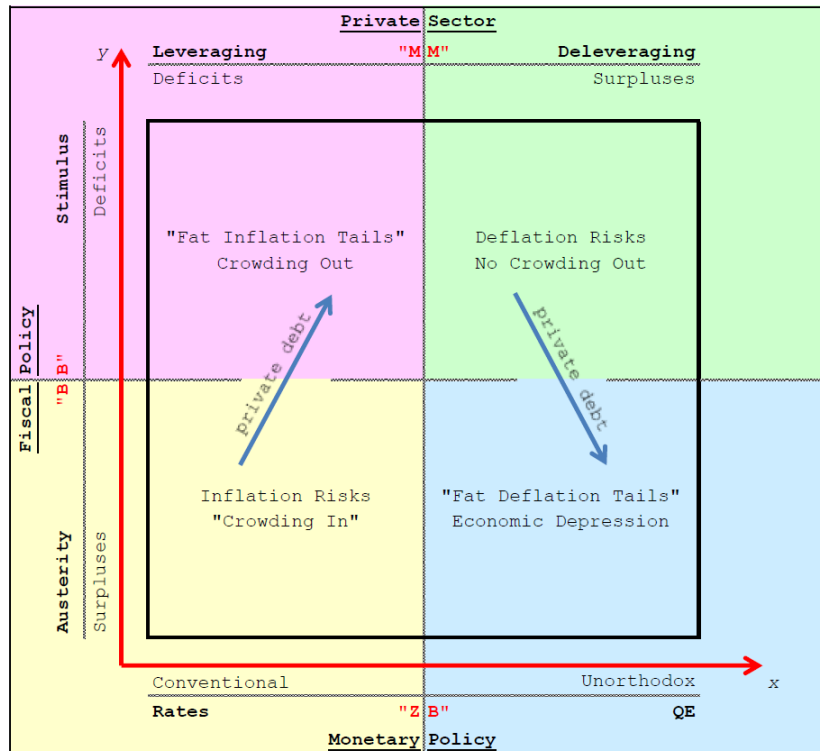


Figure 4.7. Leveraging and deleveraging in the McCulley framework; Source: McCulley (2013)

The world is, as we can see from figure 4.7 above, divided into a world of leveraging and deleveraging. Conventional macroeconomics deals with a world in which consumers are usually leveraging. In such a world, monetary policy should have its disciplining effects of preventing too much government expenditure as a way of controlling inflation and preventing crowding out effects and soften. In a deleveraging situation, monetary policy bumps in the zero boundary though. This happens because, in order for the economy to shift from leveraging to deleveraging (especially if the first rises to high levels) the economy need to go through a shock (or the Minsky Moment, as the author used), that might push the normal real interest rate below zero, and the economy in a liquidity trap, as Krugman and Eggertsson (2012) showed. This world is a little more complex one. Fiscal policy is also divided between austerity and stimulus.

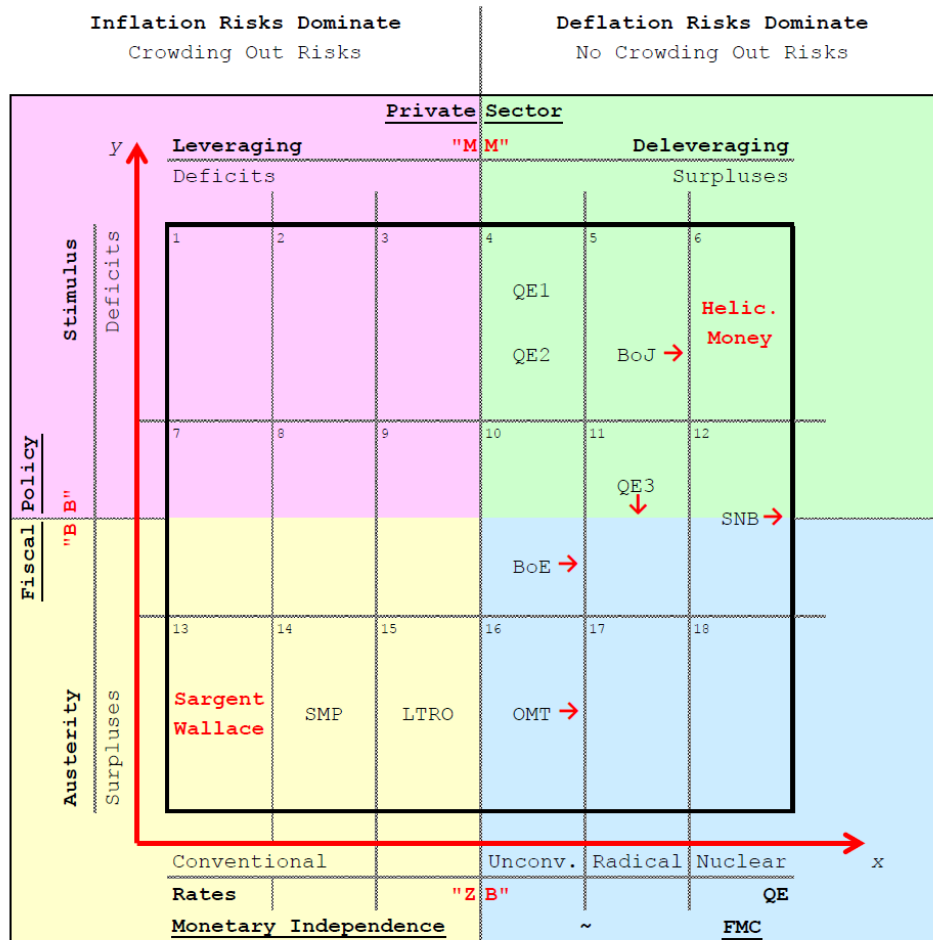
Being more specific about the quadrants in question, the north-west quadrant is a world in which both the private and public sectors are running fiscal

deficits. In such situation there are high risks of inflation and there is a high possibility of crowding out, which is a situation in which an increase in government spending reduces private investment (more details in chapter III). The monetary authority response should be to tighten up as a way to disperse the risks of inflation. Even though it might cause a recession, animal spirits won't be harmed and neither will the leverage cycle. Once the rates are lowered, the public sector will resume the borrowing.

The south-west quadrant is characterized by a deficit running private sector and a surplus public sector. Crowding out effects is no longer present. If anything, government surpluses might even "crowd in" private borrowing. The monetary authority should also keep this situation under control; tightening in the case the private sector is running too big surpluses. If the monetary authority does not do it, or do it too softly, there's the risk that a credit-fueled asset price bubble will develop itself.

When the bubble bursts, the economy shifts from leveraging to deleveraging. Animal spirits in such situation becomes negative and the private sector enters in a deleveraging mode (credit demand turns negative with the private sector running surpluses) which brings us to the east-side of the framework. In the north-east quadrant the government is running a deficit (which is not necessarily the result of activist fiscal policy). The risk is now deflation, which depends on the effectiveness of fiscal policy to offset private savings. The monetary authority now can no longer pursue conventional fiscal policies, so it must try unconventional ones (quantitative easing), which will also fail.

The Liquidity Trap in a Debt Constrained Scenario



- (1) QE Communication: Transparency and Permanence
Low ~ High
- (2) Debt/GDP Impact: ↑ ~ ↓
- (3) Ricardian Equivalence: —————→
Yes Maybe No

Figure 4.8. McCulley framework; Source: McCulley (2013)

Given this framework McCulley defends the need for monetary and fiscal policy collaboration framework and not just an inflation targeting framework. According to the author, the purpose of monetary policy in a secular deleveraging cycle is to aid fiscal policy to sustain itself, so that it won't raise questions about the sovereign debt sustainability. Following the same logic as Krugman and

Eggetsson (2012), the author defends that the fiscal policy should sustain the economy and compensate for the deleveraging of private agents.

In such situation, the fiscal authority becomes the borrower and spender of last resort as a way of stimulating economic growth directly. Such policy has to be kept until the economic slack is pushed away and the deflationary pressures cease to exist.

The inflation targeting framework, on the other hand, focus on generating inflation so that the private sector will become willing to borrow and dis-save. The problem with this policy is that, monetary policy can influence the price of credit, but not the demand for it.

4.5. Conclusion

In this session we analyzed the works on the leverage cycle, debt deflation and also McCulley framework that put together debt deflation and the leverage cycle.

Geanakoplos' work, in essence, tries to understand what situations led to the financial crisis. Why was the leverage cycle so high in the boom years and why so persistently low in the present. The work is similar to the one of Hyman Minsky (1992), which explains that in times of exceptionally prolonged prosperity, investors will jump from hedge financing units (safe) to speculative finance unit (not so safe) to Ponzi units (not safe at all). It adds to the Minsky's work though by explaining how the cycle happens.

The importance of the work of Geanakoplos comes from the fact that it helps us understand the reason why banks are not lending today. Beyond that, it also helps us understand, in a more detailed way, what happened to asset prices and to markets in the pre-crisis. But most importantly, its main contribution is that it allows us to understand the importance of the collateral in determining the demand for assets. This is important because it explains the relevance of

quantitative easing in helping an economy go through a liquidity trap and survive a large deleveraging.

In fact, if margins stay at a high level, demand for a certain class of assets will be constrained and price levels will not recover soon. This might be bad for the financial intermediaries that are exposed to those classes of assets and will reduce leverage to the overall system, leading to the current situation of lack of aggregate demand together with credit crunch.

In Fisher (1933), as we can see, the idea is quite similar to the one presented by Geanakoplos, but it is different as it focuses on debt and the effects of leveraging and deleveraging in general prices and not just of a certain group of assets. In fact, as Fisher states: “(...) over-investment and over-speculation are often important; but they would have far less serious results were they not conducted with borrowed money” which is quite similar to what Geanakoplos defends.

Krugman and Eggertsson (2012) formalize this idea in a modern way. Such formalization brings us to one of the papers main contributions, which is its understanding of the topsy-turvy economics, or how come the paradoxes of toil (increasing output actually decreases supply) and flexibility (more flexibility leads to a bigger contraction of the economy) come to happen. It does not help us to understand the paradox of thrift, though. This work also helps to the understanding of how a deleveraging shock can actually push down the real natural interest rate to a level below zero.

Finally, McCulley (2013) puts together the debt deflation theory and the leverage cycle. He does that building a framework showing the effects of monetary and fiscal policies in four different leveraging stages. In each stage, monetary and fiscal policies have a different effect and have to deal with different consequences. The importance of this work to the liquidity trap discussion is that, besides giving a visual framework to the different aspects considered in this thesis, it helps us understand where each policy situates in the possibilities spectrum, which are the limits, and what else can we try (helicopter money, for example, is the limit of

stimulus of both monetary and fiscal policies, and hasn't been tried to its full potential yet).

Some proposals and Conclusions

Sum up

In this thesis I analyzed the literature that discusses the liquidity trap, how to get out of it, the issues and consequences of high debt levels in the economy and the connection between debt and the liquidity trap.

In the first chapter we saw what the liquidity trap is and the classical and modern theoretical proposition that sustain it. Keynes (1936) was the first to describe the liquidity trap as we know it. Hicks (1937) is the one that gave it a face. Krugman (1998) was the first to give the liquidity trap a modern look. Important conclusions that arise from this chapter are that the liquidity trap can be understood as a low level equilibrium based on pessimistic expectations of aggregate demand, creating a case where the low level equilibrium is caused by self-fulfilled pessimism (the liquidity trap is then mainly an expectations and credibility problem); we also realize that there are 4 main problems that come from a liquidity trap: the deflation problem, the excessive savings problem, the aggregate demand problem and the output gap problem.

In the second chapter we saw that to get out of a liquidity trap, an economy can mainly pursue fiscal or monetary policies. Fiscal policies are really tricky under these circumstances, as “it is not enough for the fiscal policy to produce growth, but it must also lead to large increases in private demand”, in Krugman’s words. Monetary policies offer an even bigger challenge. In a liquidity trap, conventional monetary policies are mostly ineffective, unconventional monetary policies then must be tried out. Such policies can include Quantitative Easing, unconventional open-market operations, affecting inflation expectations and Svensson’s Foolproof Way.

In the third chapter, a discussion on the effect of debt on fiscal policy and the consequences of austerity was made. The debt problem is important because debt can offer an upper bound to over which expansionary fiscal policies cannot be

pursued. In this chapter I presented the main consequences of a high indebtedness, which are: vulnerability to unexpected and quick changes in investor behavior, crowding out and reduced capacity to respond to unexpected crisis; and possible solutions to reduce the indebtedness level, which are: fiscal consolidation, debt restructuring, inflation, growth and financial repression.

An analysis of the consequences of debt in fiscal policies was then made. Such consequences can take the shape of demand side and supply side effects. On the demand side we have both Keynesian (crowding out) and non-Keynesian (Ricardian equivalence, consumption smoothing) effects of expansionary fiscal policies. On the supply side it was mentioned that how the government spends its money is as important as how much. Finally, austerity policies, which are so much debated nowadays was briefly discussed. It was seen that austerity, even though effective in certain occasions, is not an all-time policy to be pursued. Austerity is a good policy when the economy is supply constrained. In this situation, also, reducing government expenditure should be preferred to raising taxes. During a liquidity trap in a debt constrained scenario, even though non-Keynesian effects of fiscal policies have to be taken care of (such as rising spread or confidence crisis), output is determined by aggregate demand and austerity should not be as beneficial (if there will be any benefits at all) as when output is supply constrained.

In the fourth chapter, the theories that combine the debt problem with the liquidity trap were studied. Firstly we saw the theory of Geanakoplos (2009), the leverage cycle, which explains how the price of assets depends not only on the interest rates of an economy, but also on the collateral rates asked when a company or an individual ask for a loan to buy this asset. There is a situation in which, the higher the leverage, the higher asset prices will become, and the more leverage, buyers will ask. On an extreme position, relatively few optimistic buyers can have the power to buy a big share of the market. This shifts in the presence of “scary bad” news, when, even the most optimistic buyers will realize that assets were overvalued, and the economy enters in deleveraging.

Krugman and Eggertsson (2012) then explain what happens when an economy enters in a deleveraging phase, and how this can push an economy into a liquidity trap. To do that they base themselves in Fisher's debt-deflation theory of great depressions, which shows how, when an economy deleverages, the real value of debt actually increases. This, as Krugman and Eggertsson showed, will push the economy in the topsy-turvy economics world which configures a liquidity trap where the paradoxes of thrift (more savings generates less savings), toil (higher supply output actually contracts the equilibrium output) and flexibility (the bigger the supply flexibility, the higher the contraction in the face of an aggregate demand shock) arises.

Finally, McCulley (2013) framework which shows the different combinations of fiscal and monetary policies in different leverage phases was analyzed. To get out of a liquidity trap McCulley defends the idea of fiscal and monetary collaboration where the central bank prints money as a way of financing the fiscal authority. An interesting feature of this model is how it interprets leveraging as being the private sector running deficits. In fact, if we think this way, when the economy is deleveraging, the private sector is actually running surpluses, which means that they are spending less than they are earning. In McCulley interpretation, this means that the government should run fiscal deficits (financed by monetary easing) to compensate.

Contextualizing

To put this thesis in a more contextual perspective, the conclusion we can take from this work is that an economy will be brought to a liquidity trap, when it suffers from a strong external shock, such as a financial crisis. This shock can have different causes: endogenous, such as the one that happened in Japan or in the US; or exogenous, when an economy suffers from contagion from another big economy that suffered from the endogenous shock in the first place, for example, continental Europe except for Spain (which actually had a housing bubble on its own).

The main cause of the current financial crisis and recession that followed was the households and private sector over indebtedness in the US. This

constrained households to deleverage as soon as problems arose after increased volatility given the collapse of Lehman Brothers. The shift from a leveraging economy to a deleveraging one is what is called the Minsky Moment and is what pushes the economy into a liquidity trap.

The leverage cycle rationale though does not seem to have been, alone, the culprit for the crisis. The principle of Minsky's theory also helped. In fact, if the market did not have so much liquidity constantly seeking for higher yields, it is unlikely that investors and speculators would have so much disposable money to finance with such high leverage the buying of houses.

Once in a liquidity trap, following a Keynesian multi-equilibrium model, the economy will be trapped in a high liquidity and low growth state equilibrium. This is the main danger of a liquidity trap, for this lowers future potential output of the economy or, in other words, it makes an economy lose years of economic growth.

This happens because, while the economy is in a liquidity trap situation, demand is put in a lower level than before. In this case, higher output doesn't push up demand; on the contrary, it might even depress it. What happens is that companies will decrease their output capacity or prices in order to meet lower demand levels. This, however, will have as a consequence lower prices and lower wage levels, which will raise the real value of the debt burden, which is always incurred in nominal values.

In order to get out of a liquidity trap then what must happen is a change in people's expectations that takes out equilibrium from a liquidity trap level, to a new, higher level.

In a country in a situation such as the US or Japan, this can only happen through a combination of unconventional monetary policies and expansionary fiscal policies, that will give time for the private sector to deleverage while also helping to change expectations away from recessionary feelings that might put the economy into an undesirable depression spiral: recession plus deleveraging brings

deflation that actually pushes up indebtedness level. This will bring forward even more deleveraging, more recession and more deflation in a debt-deflation style.

Once the country is out of the liquidity trap equilibrium (nominal real interest rate comes back to above zero), market confidence will shift the speculative money from safe bonds to the more rewarding (now with a lower volatility and better perspectives) stock market.

Policies and alternatives

To be more detailed on the possibilities of policies that advanced economies can pursue, in order to reach the goal of getting out of a liquidity trap, I divide them now between monetary, fiscal and other policies.

Monetary policies

The liquidity trap is basically characterized by an impotence of conventional monetary policies as interest rates cannot go below zero. Therefore, unconventional monetary policies must be tried out. The quantitative easing framework presented seems to be quite promising. Even though the biggest fear to such a policy is excessive inflation, the USA and Japan have been pressing with the policy for quite some time without that fear actually being materialized. The Foolproof Way (based mainly on the expectations framework and in lowering the exchange rate) introduced by Svensson is complimentary to quantitative easing, as the latter can be considered a way with which the monetary authority can make itself credible. In fact, with Abenomics (the name of the economic principles that guide the government of Japan's current Prime Minister: Shinzo Abe), when Japan's monetary authority credibly committed to a long term expansion in the monetary base and a 2% inflation goal, we could see a strong depreciation of the yen towards the US dollar.

Fiscal Policies

Even though the effectiveness of fiscal policies, in taking an economy out of a liquidity trap, has not been proved, an expansionary fiscal policy might help to

assist an economy while the private sector deleverages. However, given the current debt constraint imposed by the market on expansionary fiscal policies, governments from now on will have to be more inventive in pursuing growth policies.

One important conclusion we can take from this research is that, since we are not in the middle of just one lower bound for monetary policy, but also at (or very close to) an upper bound for fiscal policy, a really careful and calculated strategy has to be defined. This strategy has to be mainly Keynesian in its essence (since we are facing a Keynesian scenario), but must also take care of non-Keynesian effects. In such a scenario I offer some ideas of policies that do not involve unsustainably raising the fiscal deficit now, which could cause the debt problem situation to deteriorate and bring forward its consequences of rising spread and even higher market uncertainty.

Changing the composition of fiscal spending

The idea behind this proposal is the one mentioned in the session 3.4 of supply-side effects of fiscal policies. In this session it was mentioned that some government expenditures have more positive externalities than others. This means that for some fiscal expenses the fiscal multiplier might be higher than others. Changing the composition of how the government spends its money by reducing (within reasonable boundaries, obviously) the low externalities components to the high externalities ones, will leave the total fiscal spending unchanged, while having the same effect of a fiscal expansion (a leaner state, we could say). A historical example of this is the reduction in military retirees' pension by 15% executed by Franklin D. Roosevelt as one of his New Deal measures used to take the US economy from the depression that followed 1929's crash (Leuchtenburg, 1963).

Privatizations

Some countries still maintain the total or partial ownership of many companies. Selling some of them by opening their capital on the local stock

exchange at a reasonable valuation might be a way of raising funds to be spent more effectively somewhere else.

Credibly committing to a sustainable debt level in the future

As I mentioned in the last session of Chapter III, if we think of a scenario in which consumers have rational expectations, if a country manages to commit to be responsible in the future, by assuring investors that it will keep the debt levels under an acceptable level (for example, a programmed austerity policy to be executed two years from now, an international agreement, or a mechanism of triggers for austerity policies that will come into existence, given certain conditions under which debt shows signs of beginning to be unsustainable), consumers might tolerate a fiscal expansion in the present. If the country can do it credibly, it will be able to make a temporary expansionary fiscal policy without increasing the debt unsustainability fears and uncertainty in the market (as discussed in the work of Bertola and Drazen).

Other policies

While expansionary fiscal and monetary policies find their way to effectiveness (in the sense that, up to now, both traditional expansionary monetary and fiscal policies failed to deliver a consistent result), other policies can be tried.

From the solutions proposed by Geanakoplos, an interesting one is the creation of a Fed lending facility. In fact, the creation of a temporary (it must be temporary) government lending facility can be a really interesting solutions to countries such as Italy or England that are also in the middle of a credit crunch for medium and small enterprises. Such a facility could lend money to small and medium entrepreneurs that currently cannot access credit from the financial intermediaries. In this way, it would not offer competition to financial institutions which are already facing problems. It must be temporary though, so that it won't end up competing with private financial institutions at a later stage.

Some structural policies must also be tried, in order to try to push animal spirits up. Such policies could be easing the process of opening a company and

reduction of business and workers' taxes. In fact, ever since the time of Schumpeter it is known that innovation is one of the key drivers for economic growth, as it increases both supply, and demand (by increasing the amount of goods that can be bought in the consumption function).

Krugman and Eggertsson (2012) shows that increasing labour flexibility is not good, as a lower wage will be translated in lower prices and thus higher indebtedness levels. That is true, but it should not prevent countries such as Italy and Spain from pushing into a better system that allows them to employ their young workers.

To sum everything up, we can conclude that the road to recovery will and cannot be painless. The sooner, harsh and bold measures are taken, the smaller the amount of time will be spent in pain.

References

- Alesina, Alberto, Silvia Ardagna, Roberto Perotti, and Fabio Schiantarelli (2002). “Fiscal Policy, Profits, and Investment.” *American Economic Review*: 571–589.
- Alesina, Alberto F., and Silvia Ardagna (2009). “Large Changes in Fiscal Policy: Taxes Versus Spending.” *Working Paper. National Bureau of Economic Research*.
- (2012). “The Design of Fiscal Adjustments.” *National Bureau of Economic Research*.
- Alstadheim, Ragna, and Dale W. Henderson (2004). “Price-level Determinacy, Lower Bounds on the Nominal Interest Rate, and Liquidity Traps.” *Contributions in Macroeconomics* 6, no. 1: 1–27.
- Benford, James, Stuart Berry, Kalin Nikolov, Chris Young, and Mark Robson (2009). “Quantitative Easing.” *Bank of England Quarterly Bulletin* 49, no. 2: 90–100.
- Benhabib, Jess, George W. Evans, and Seppo Honkapohja (2012). “Liquidity Traps and Expectation Dynamics: Fiscal Stimulus or Fiscal Austerity?” *National Bureau of Economic Research*.
- Benhabib, Jess, Stephanie Schmitt-Grohé, and Martin Uribe (2002). “Avoiding Liquidity Traps.” *Journal of Political Economy* 110, no. 3: 535–563.
- (2001). “The Perils of Taylor Rules.” *Journal of Economic Theory* 96, no. 1: 40–69.
- Benhabib, Jess, Pengfei Wang, and Yi Wen (2013). “Uncertainty and Sentiment-Driven Equilibria”. *National Bureau of Economic Research*.
- Bernanke, Ben S., Vincent R. Reinhart, and Brian P. Sack (2004). “Monetary Policy Alternatives at the Zero Bound: An Empirical Assessment.” *Brookings Papers on Economic Activity*, no. 2: 1–78.

- Bertola, Giuseppe, and Allan Drazen (1991). “Trigger Points and Budget Cuts: Explaining the Effects of Fiscal Austerity”. *National Bureau of Economic Research*.
- Blanchard, Olivier (2000). “Bubbles, Liquidity Traps, and Monetary Policy: Comments on Jinushi et Al, and on Bernanke.” *Japan’s Financial Crisis and Its Parallels to the US Experience*. *Institute for International Economics*.
- . “O. Blanchard, Scoprire La Macroeconomia (I: Quello Che Non Si Può Non Sapere).” (2006) *Il Mulino* (n.d.).
- Blyth, Mark (2013). “Austerity: The History of a Dangerous Idea”. *OUP USA*.
- Boitani, Andrea (1986). “Appunti Sulle Teorie Dell’occupazione”. *Vita e pensiero*.
- Crafts, Nicholas (2013). “Escaping Liquidity Traps: Lessons from the UK’s 1930s Escape.” *VoxEU.org*.
- DeLong, J. Bradford, Lawrence H. Summers, Martin Feldstein, and Valerie A. Ramey (2012). “Fiscal Policy in a Depressed Economy [with Comments and Discussion].” *Brookings Papers on Economic Activity*: 233–297.
- Eggertsson, Gauti B., and Paul Krugman (2012). “Debt, Deleveraging, and the Liquidity Trap: A Fisher-Minsky-Koo Approach*.” *The Quarterly Journal of Economics* 127, no. 3: 1469–1513.
- Eggertsson, Gauti B., and Benjamin Pugsley (2006). “The Mistake of 1931: a General Equilibrium Analysis”. *CFS working paper*.
- Eggertsson, Gauti B., and Michael Woodford (2003). “The Zero Bound on Interest Rates and Optimal Monetary Policy.” *Brookings Papers on Economic Activity* 2003, no. 1: 139–211.
- Fisher, Irving (1933). “The Debt-Deflation Theory of Great Depressions.” *Econometrica* 1, no. 4: 337–357.

- Geanakoplos, John (2010b). “Solving the Present Crisis and Managing the Leverage Cycle”. *SSRN Scholarly Paper*. Rochester, NY: Social Science Research Network.
- (2009). “The Leverage Cycle.” *NBER Macroeconomics Annual* 24, no. 1: 1–66.
- Giavazzi, Francesco, and Marco Pagano (1990). “Can Severe Fiscal Contractions Be Expansionary? Tales of Two Small European Countries.” In *NBER Macroeconomics Annual 1990, Volume 5*, 75–122. MIT Press.
- Guajardo, Jaime, Daniel Leigh, and Andrea Pescatori (2010). “Will It Hurt? Macroeconomic Effects of Fiscal Consolidation.” *IMF World Economic Outlook*.
- Hall, Robert E. (2011). “The Long Slump”. *National Bureau of Economic Research*.
- Hemming, Richard, Michael Kell, and Selma Mahfouz (2002). “The Effectiveness of Fiscal Policy in Stimulating Economic Activity--A Review of the Literature”. *International Monetary Fund*.
- Hicks, J. R. (1937). “Mr. Keynes and the ‘Classics’; A Suggested Interpretation.” *Econometrica* 5, no. 2: 147–159.
- Krugman, Paul R. (2000). “Thinking About the Liquidity Trap.” *Journal of the Japanese and International Economies* 14, no. 4: 221–237.
- Krugman, Paul R., Kathryn M. Dominguez, and Kenneth Rogoff (1998). “It’s Baaack: Japan’s Slump and the Return of the Liquidity Trap.” *Brookings Papers on Economic Activity* Vol. 1998, no. No. 2: pp. 137–205.
- Leuchtenburg, William Edward (1963). “Franklin D. Roosevelt and the New Deal, 1932-1940”. *Harper & Row New York*.
- Lucas, Robert E. (1986). “Adaptive Behavior and Economic Theory.” *The Journal of Business* 59, no. 4: S401–S426.

- Lucas, Robert E., and Edward C. Prescott (1971). "Investment Under Uncertainty." *Econometrica* 39, no. 5: 659–681.
- McCulley, Paul (2012). "Does Central Bank Independence Frustrate the Optimal Fiscal-Monetary Policy Mix in a Liquidity Trap?" *GIC Global Society of Fellows*.
- McCulley, Paul, and Zoltan Pozsar (2013). "Helicopter Money: Or How I Stopped Worrying and Love Fiscal-Monetary Cooperation".
- Murphy, Kevin M., Andrei Shleifer, and Robert W. Vishny (1988). "Industrialization and the Big Push". *National Bureau of Economic Research Cambridge, Mass., USA*.
- Orphanides, Athanasios (2004). "Monetary Policy in Deflation: The Liquidity Trap in History and Practice." *The North American Journal of Economics and Finance* 15, no. 1: 101–124.
- Prychitko, David L. (2010). "Competing Explanations of the Minsky Moment: The Financial Instability Hypothesis in Light of Austrian Theory." *The Review of Austrian Economics* 23, no. 3: 199–221.
- "Still Say's Law After All These Years." *Paul Krugman Blog*. Accessed May 20, 2013. <http://krugman.blogs.nytimes.com/2013/02/10/still-says-law-after-all-these-years/>.
- Sutherland, Alan (1997). "Fiscal Crises and Aggregate Demand: Can High Public Debt Reverse the Effects of Fiscal Policy?" *Journal of Public Economics* 65, no. 2: 147–162.
- Svensson, Lars E. O. (2000). "The Zero Bound in an Open Economy: A Foolproof Way of Escaping from a Liquidity Trap". *Working Paper. National Bureau of Economic Research*.