

*Notes on New Keynesians*

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### **Introduction**

The Law of Supply and Demand is not in fact a law, nor should it be viewed as an assumption needed for competitive analysis. It is rather a result generated by the underlying assumptions that prices have neither sorting nor incentive effects. The usual result of economic theorizing, that prices clear markets, is model-specific and is not a general property of markets—unemployment and credit rationing are not phantasms. (Stiglitz and Weiss: 1981, p.273)

Principal agent, incomplete information, informational asymmetries, non-clearing markets. These are some of the general topics that describes the New Keynesian paradigm. Using a game theoretical approach and taking on adverse selection, moral hazard and adverse incentives this paradigm has been best exposed in models for the labor market (efficiency wage) and financial markets (credit rationing).

Although accepted and respected in Academia, the results of the New Keynesian paradigm are different from Neo and New Classical tradition:

Conventional competitive economic theory begins with hypothesis of price-taking firms and consumers, buying and selling homogeneous commodities at well-defined market places. In many situations this assumptions are implausible...In capital markets banks know that the probability of bankruptcy differs across loans, but cannot tell precisely which loans are better. (Stiglitz: 1987, p.2)

The outcomes generated by New Keynesians challenge. The mainstream by undermining the general equilibrium vision of markets; [*a]n interesting aspect of recent USA new-Keynesian research is the near-total lack of interest in the general equilibrium*

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*properties of non-market-clearing models* (Gordon: 1990, p. 1137). This is, when you think about it, very interesting ideologically.

Following almost the same methodology of Neoclassical economics (Fazzari: 1994, p.354) (and with that, acquiring the same prestige), New Keynesians undermine the New Classical foundations and destroy the Neoclassical micro-foundations by showing that markets work different than mainstream explains.

At the micro level New Keynesians claim that markets are structured with inefficiencies, in other words, that there might not be an equilibrium to reach, and if there is one, it will not be a Walrasian equilibrium at all. Every market is not at a Walrasian equilibrium prior to the identification of any externality or failure. Prices affect quality and commodities are not homogeneous. Thus, changes in prices will change the composition of commodities in the market, but buyers cannot identify among commodities (which is the good and which is the bad one). Although, they know that as prices change, the composition of commodities will change too. Buyers (banks, firms or individuals) have incomplete information. Thus, buyers do not know which commodity is which, until s/he buys it (i.e., a lemon car), and *[w]hen quality depends on price, market equilibrium may be characterized by demand not equaling supply* (Stiglitz:1987, p.4).

This is a powerful critique to the Neoclassical paradigm. But unclearing market are not even the most important observation. Prices at the equilibrium will not be Pareto efficient, following the New Keynesian tradition, that is, competitive prices are inefficient.

In each of these cases, the story is the same: because quality (labor efficiency, bankruptcy probability) changes as the price (wage, interest rate) changes, excess supply or demand may persist without any tendency for price (wages, interest rates) to move to correct the market unbalance. ( *ibid*: p.7)

This means that the resource allocation is inefficient, in the case of financial markets, investment is inefficient. In the Neoclassical view prices adjust automatically, but here prices can be rigid or sticky to supply and demand shocks. Thus, prices do not change quite easily to reflect the new situation, which then present a coordination problem.

At the macro level New Keynesians claim that the capital structure of firms affect investment, which is an argument in contradistinction to Modigliani-Miller Theorem. Capital costs for internal funds are cheaper than for external funds. Also, demand shocks (either negative or positive) have a greater impact on investment than what the traditional Neoclassical approach affirms, because of financial effects. From the New Keynesian perspective, monetary policy changes the quality of credit available, but not necessarily the price. Thus, the institutional structure of financial intermediaries matters. Banks do things no one else can do (informational functions). Then, the Fed's actions can create problems to potential borrowers.

As with the game theoretical presentations, here the informational requirements for the lender (leader) are quite demanding. Among other things, s/he has to know the proportions of good and bad borrowers in the market and the preference functions of borrowers (followers), in other words, all the information required to construct his/her reaction function. Further, to construct the principal agent complex a conflict of interest is required (without it there will be no credit rationing), and here the conflict of interest is over the prospect of default. Then, as an outcome of all this, truncated expectation functions will emerge.

In what follows the task will be to present, analyze and criticize the New Keynesian paradigm and its manifestation in financial market models. To this end, four sections will be entertain. In **The Setup**, the general idea of the type of models in the New Keynesian tradition is presented. In **New Keynesian Conclusions**, arguments that emerged from this analysis will be discussed. Following that, in **Policy** the implications that unfold, in terms of government intervention and monetary policy, are entertain. Finally, in **Concluding Remarks** a critique to the New Keynesian view is developed.

### **The Setup**

The special nature of credit markets is most evident in the case of credit rationing, where borrowers are denied credit even though they are willing to pay the market interest rate (or more), while apparently similar borrowers do obtain credit. (Jaffe and Stiglitz: 1990, p.839)

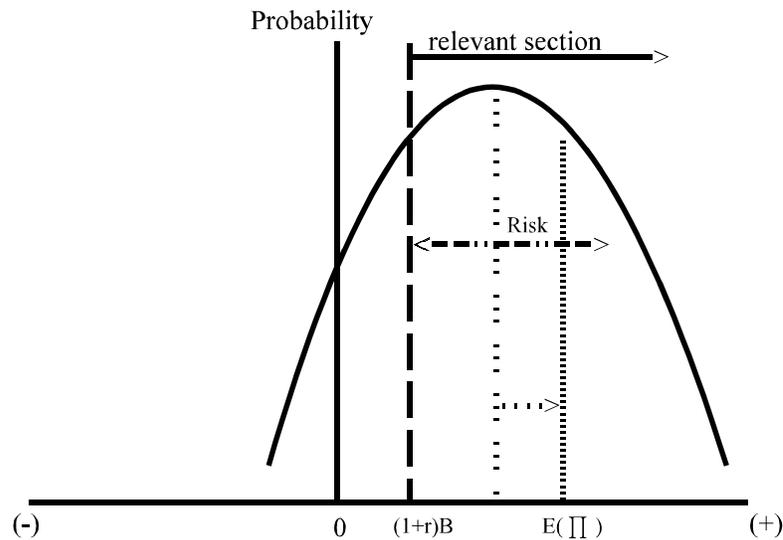
In general, the usual problem starts by assuming risk neutrality for firms and lenders<sup>1</sup>. Then a project with two possible outcomes is considered: a good outcome ( $X_g$ ) and a bad outcome ( $X_b$ ). Where  $X_g > (1+r)B$  and  $X_b < (1+r)B$  (here,  $r$  is the interest rate and  $B$  is the exogenously determined size of the loan). If the outcome is  $X_g$ , banks will get  $(1+r)B$  and firms will receive  $X_g - (1+r)B$ . Other wise if the outcome is  $X_b$ , firms will default and banks will get  $X_b < (1+r)B$ . While defaults are a disaster for banks, firms do not suffer any negative consequences from default and here is where the conflict of interest arises. This situation will induce borrowers toward risk, since default is not a problem. This

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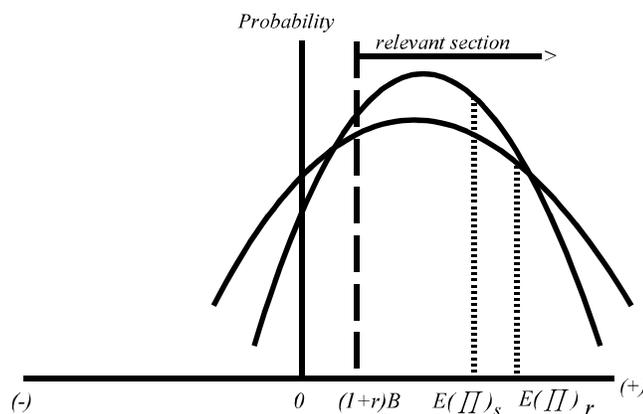
1. Otherwise the problem will be built on the utility functions of borrowers and lenders and not on the nature of the market itself. That will be case where lenders are risk averse and borrowers are risk lovers (if both are risk lovers or risk averse, there will be no conflict of interest).

assumption, in general, is the entry point for the more important one: if borrowers choose riskier projects expected profits will rise for them. Risk ( $\theta$ ) here is presented as a measure of dispersion of probable outcomes:  $\theta = X_g - X_b$ . As the gap increases, so will risk.

For example, if  $X_g$  increases and  $X_b$  decreases, the whole gap will increase. This will have no impact on banks, since they have no gains from increases in  $X_g$ . Banks will lose every dollar from changes in  $X_b$ , (the default payment) that is way only bad news matter for banks. On the contrary, firms will get every dollar of the increase in  $X_g$ . Firms lose nothing from changes in  $X_b$ . Here only good news matter. Then, higher risk will not hurt firms but only banks, since their expected return decreases with risk. Thus, the technical outcome from the ‘news’ are truncated functions:



Expected profits for firms  $[E(\Pi)]$  move to the right because of the truncation. Then with a riskier project<sup>2</sup>:



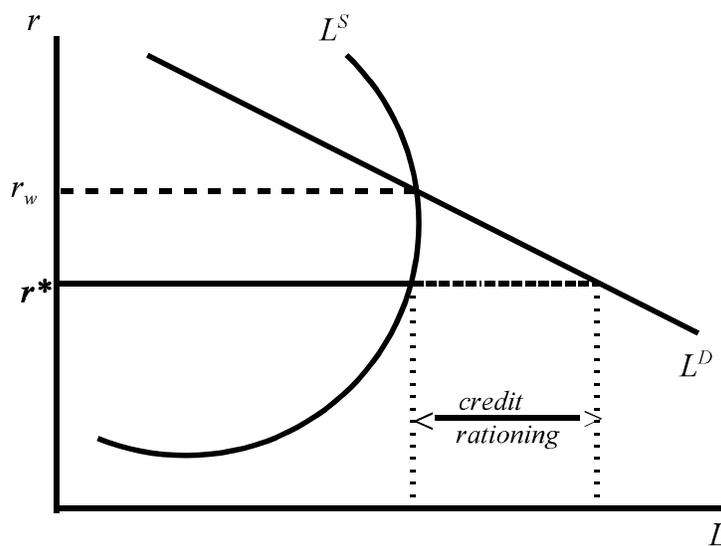
Expected profits are a function of risk and this is what creates conflict (i.e., moral hazard or adverse selection). The truncation come about because firms will care less about default.

Lenders (leader) will act by setting the interest rate. Later, borrowers (followers) will respond parametrically<sup>3</sup>. Then, the leader takes into account the responds to construct the reaction function. Interest rates will increase and as a result banks will get more money from those who do not default (neoclassical direct effect), but, as a result of adverse selection, there will be also a change in the behavior of the applicants pool towards riskier investment projects (higher risk of default) and with that less expected returns (New Keynesian indirect effect). Thus, beyond some point, there is no incentive to increase the interest rate ( $r$ ), because it will result in less expected returns. If the loan demand ( $L^D$ ) intersects the loan

2.  $E(\Pi)_s$  and  $E(\Pi)_r$  refer to the expected profit for the safer and riskier project respectively.

3. Parametrically means that borrowers accept ' $r$ ' as given - a fixed parameter. Banks act strategically, they will change ' $r$ ' depending on the expected borrower reaction to any given ' $r$ '.

supply ( $L^S$ )<sup>4</sup> (Gertler: 1988, p. 569) at a point above the profit maximizing rate <sup>5</sup> ( $r^*$ ), there will be credit rationing (Jaffe and Stiglitz: 1990, p. 847). Credit rationing is broadly defined as a situation in which there exists an excess demand for loans because quoted loan rates are below the Walrasian market-clearing level.



Why is credit rationing? Perhaps the most basic tenet of economics is that market equilibrium entails supply equaling demand, that if demand should exceed supply, prices will rise, decreasing demand and/or increasing supply until demand and supply are equated at the new equilibrium price. So if prices do their job, rationing should not exist. However, credit rationing and unemployment do in fact exist. (Stiglitz and Weiss: 1981, p.247)

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4. Stiglitz and Weiss show that, given their assumptions, the loan supply curve may bend backwards and the credit rationing can emerge as a consequence. Essentially, the lemon's principal is at work. A rise in the interest rate lowers the average borrower quality, as those with relatively safe projects are the first to drop out. Thus, after a point, further increases in the interest rate may lower lenders' expected returns, making the loan supply curve bends backwards.

5. Here  $r_w$  is the Walrasian rate.

There are two ways of getting the indirect effect. Through adverse selection, as 'r' increases, good applicants leave the pool, then the leader takes into account the reaction function of borrowers. Also, through adverse incentives. As 'r' increases, the incentive to move to riskier project will increase, and with that, the probability of default increases too.

In this sense credit rationing is not about price rationing (it is not neoclassical). Also, it is not that the increase in risk causes the increase in 'r'. Credit rationing is about individual borrowers and projects indistinguishable in terms of risk (observationally indistinguishable applications). They are different, but lenders cannot see them.

Recent theoretical research on the functioning of capital markets shows that asymmetric information can cause credit to be rationed or prevent firms from obtaining funds through new equity issues, even though firms have investment opportunities with positive net present value. That is, projects that will increase the value of firms and would be undertaken according to neoclassical theory might be constrained by financial markets. (Fazzari: 1994, pp.351-52)

Following the bimodal presentation of Jaffe and Stiglitz, we have two types of borrowers: 'a' (good) and 'b' (bad) (Jaffe and Stiglitz: 1990, p. 842), with  $X_i$  as the good outcome and 0 as the bad outcome. The probability for  $X_i$  will be  $P_i$  and for 0 will be  $(1-P_i)$ . Then, the expected return for  $X_a$  will be  $P_a$  times  $X_a$  and for  $X_b$  will be  $P_b$  times  $X_b$ .<sup>6</sup> Banks will prefer 'a', since they will get the same outcome (payback), but with lower risk.

In the case of borrowers assuming zero collateral and indifference towards risk at some point the 'a' projects expected return will disappear as the interest rate (r) increases.

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6. Here we will have the same return but different risk:  $X_a P_a = X_b P_b$ . Also, for mean preserving:  $X_a < X_b$ ;  $P_a > P_b$ . In terms of returns on banks ( $\Phi$ ) we will have:  $\Phi_i = (X_i - 0)$ . So  $\Phi_b > \Phi_a$ , that is, b is riskier.

Then, ‘a’ borrowers will dropout, since their return will be negative from that point on. In term of expected profits, we have then:

$$\begin{aligned} \Pi_i &= \max[0 \text{ if default ; } X-i - (1+r)B \text{ if success}] \\ E(\Pi_a) &= a(1 - P_a) + P_a(X_a - (1+r)B) \\ &= P_a X_a - P_a(1+r)B \end{aligned}$$

And by the same token:  $E(\Pi_b) = P_b X_b - (1+r)B$  Thus, the ‘b’ project will have the higher return, since the expected loan repayment for ‘a’ will be higher. The ‘b’ project has a higher probability of default, so its expected loan repayment is lower. As the interest rate increases, the expected net return<sup>7</sup> for ‘a’ drops<sup>8</sup>. That is, as ‘r’ increases ‘a’ hits zero before ‘b’<sup>9</sup>. Then the gist is to find a value of ‘r’ such that  $E(\Pi_a)$  equals zero:

$$\begin{aligned} E(\Pi_a) &= P_a X_a - P_a(1+r)B = 0 \\ \hat{r} &= \frac{X_a}{B-1} \end{aligned}$$

and by substituting this value:

$$\begin{aligned} E(\Pi_b) &= P_b X_b - P_b \left( 1 + \frac{X_a}{B-1} \right) \\ &= P_b (X_b - X_a) > 0 \end{aligned}$$

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7. The gross expected return is equal for both, but  $E(\Pi_b) > E(\Pi_a)$

8.  $\frac{\partial E(\Pi)}{\partial \Phi} > 0$  So borrowers will be better off, because of the truncated functions.

9. As ‘r’ increases,  $E(\Pi_a)$  decreases and will hit zero, while  $E(\Pi_b)$  will be greater than zero:

$$\frac{\partial E(\Pi_i)}{\partial r} < 0 ; \quad \frac{\partial E(\Pi_a)}{\partial r} = -P_a B ; \quad \frac{\partial E(\Pi_b)}{\partial r} = -P_b B ; \quad |P_a B| > |P_b B|$$

as the probability of default increases, the expected repayment to banks decreases.

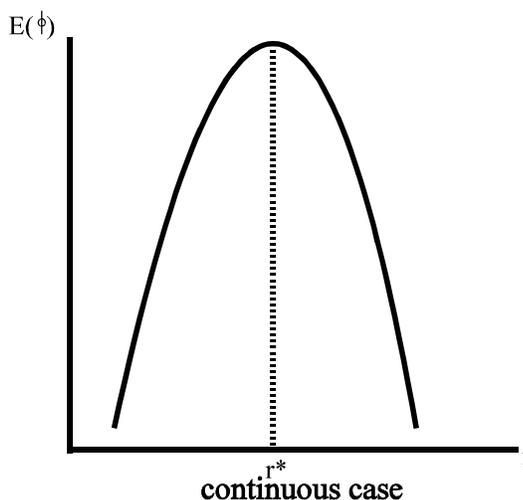
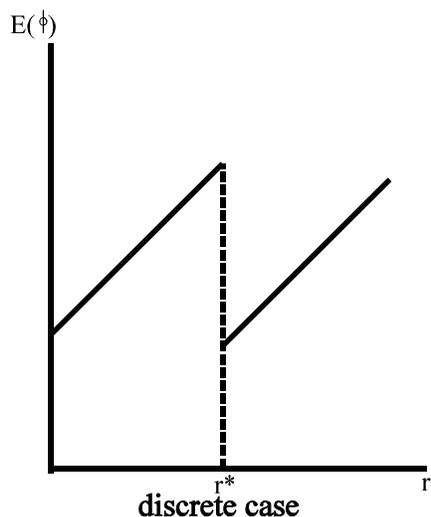
Now the lender (leader) has to calculate the reaction function<sup>10</sup>:

$$\Phi = \min [(1+r)B \text{ if success}; 0 \text{ if failure}]$$

$$E(\Phi) = (1+r)B[ZP_a + (1-ZP_b)]$$

This is the probability that the average loan will repay, times what the bank gets. Since  $P_b < P_a$ , if the bank increase 'r' to  $r^*$  It will confront a discrete change to  $[0 + 1-ZP_b]$  (or  $1-ZP_b$ ).

In a per loan basis:



$$E(\Phi) = (1+r)B [ZP_a + (1-ZP_b)]$$

$$\frac{\partial E}{\partial r} = \left( \frac{B[ZP_a + (1-ZP_b)]}{(\text{direct positive effect})} \right) + \left( \frac{(1+r)B \partial Z/\partial r (P_a - P_b)}{(\text{indirect negative effect})} \right)$$

10. Here, the proportion of the pool of applicants will be the following: for type 'a' will be equal to  $Z_{q_0}$  and for type 'b' will be equal to  $(1-Z_{q_0})$ . This is a crucial assumption, banks are assumed to know precisely how the applicant pool will respond to every change in 'r'.

At the beginning, the positive effect dominates, but at certain point the negative effect will start dominating<sup>11</sup> (beyond  $r^*$ ). So credit rationing emerge:

11. This presentation was considered under a mean preserving argument, but that not need to be the case as the following example of adverse selection (modification from Jaffe and Stiglitz). Assume two possible outcomes: 0 or  $X_i$ , with probabilities:  $(1-P_i)$  and  $P_i$  respectively. Here,  $X_b > X_a$  and  $P_a > P_b$ , and  $P_a X_a > P_b X_b$ . Thus,  $X_a$  is safer and have a higher expected return( it is not mean preserving).

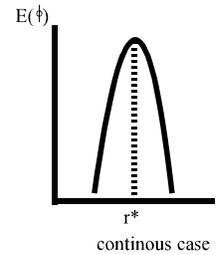
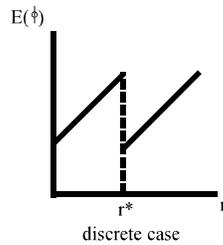
For the firm:  $X(\Pi_i) = P_i (X_i - (1+r)B)$ . Now if  $r=0$  then  $X(\Pi_a) > E(\Pi_b)$ , so the initial incentive is to go with the safer. Here,  $\partial E(\Pi_i)/\partial r = -P_i B < 0$  and since  $P_a > P_b$  the expected profits for  $X_a$  deteriorates faster as  $r$  increases. In other words, as  $r$  increases,  $E(\Pi_a)$  decreases faster than  $E(\Pi_b)$ . At some  $r$  (called  $\hat{r}$ )  $E(\Pi_a) = E(\Pi_b)$ . As  $r > \hat{r}$  firms shift to the 'b' project. Then the question is: what is  $\hat{r}$ ?

$$\hat{r} = \frac{P^a X^a - P^b X^b}{B(P^a - P^b)} - 1$$

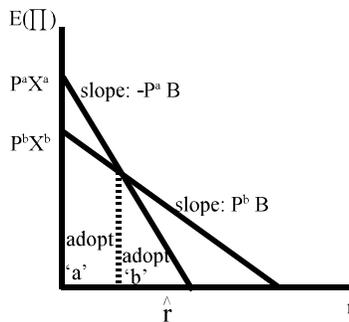
Note here that we do not have a mean preserving situation, here  $P_a X_a > P_b X_b$ . Then, for

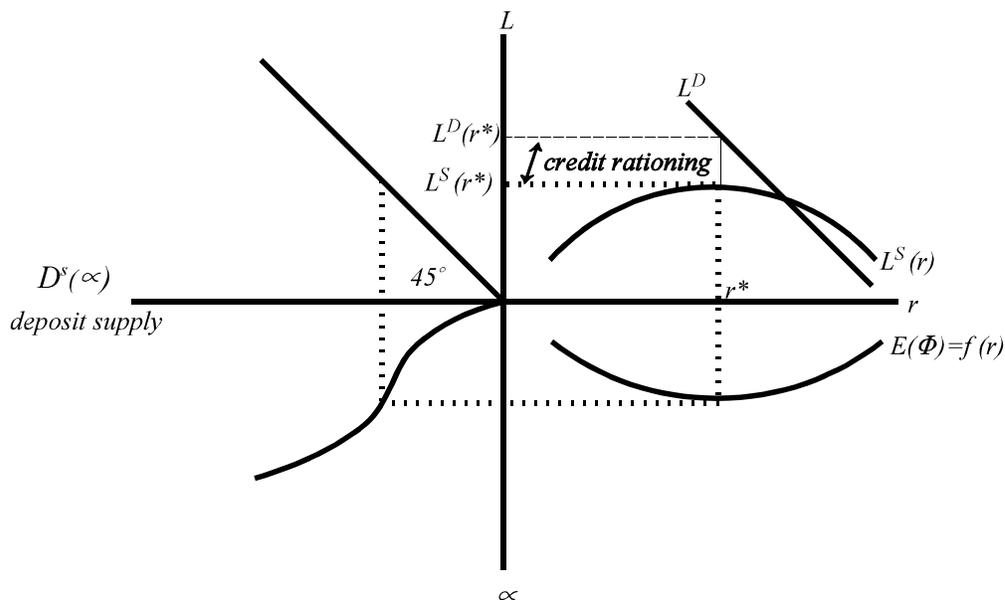
$$\begin{aligned} \text{Banks: } E(\phi) &= P_a(1+r)B \\ &= P_b(1+r)B \end{aligned}$$

recall:  $P_a > P_b$



And again, we have truncated functions:

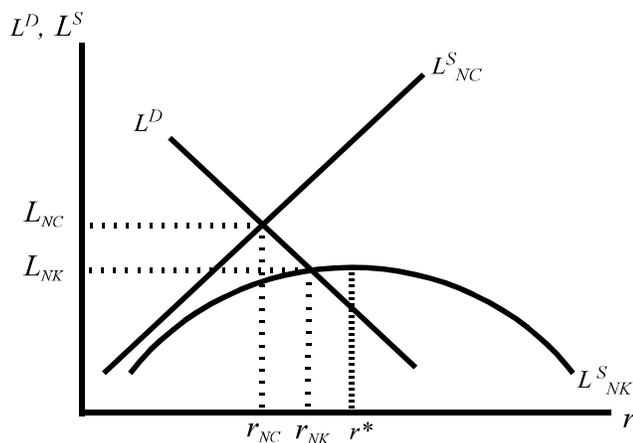




### New Keynesian Conclusions

No law in economics has such standing as the “Law of Supply and Demand.” There is an old joke about being able to teach a parrot to be an economist—and a good economist at that—simply by teaching it to repeat the words “demand and supply”. (Stiglitz: 1987, p.4)

Following the New Keynesian presentation, we will have credit rationing. But even if this is not the case, we still have the New Keynesian arguments:



Without credit rationing (as the case above), the interest rate that follows the New Keynesian view ( $r_{nk}$ ) is greater than the one that follows the Neoclassical presentation ( $r_{nc}$ ). So we have that  $r_{nk} > r_{nc}$  and with that then,  $L_{nk} < L_{nc}$ . As a result, we will have the Åkerlof lemon's premium, where the interest rate will be too high for good borrowers, but too low for bad borrowers.

This assumption of a competitive market for homogeneous commodities is neither plausible nor innocuous. Markets in which commodities are completely homogeneous-with respect to location and the date as well as other characteristics- are almost inherently sufficiently thin so that the postulate of perfect competition is inapplicable. Markets that are sufficiently "thick" to be competitive are almost always nonhomogeneous. (Stiglitz: 1987, p.25)

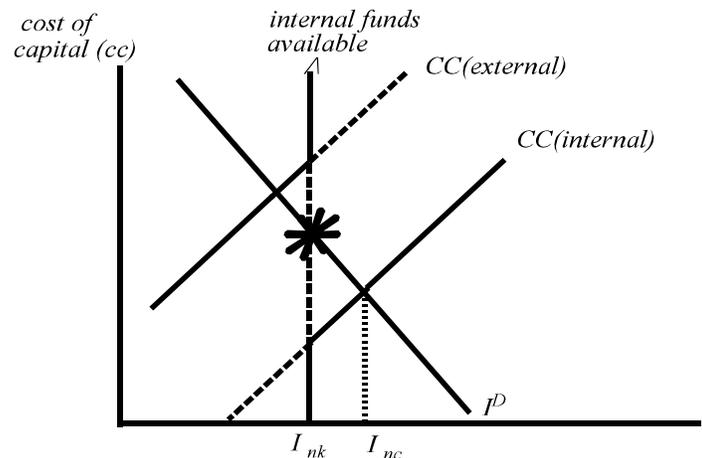
In other words, the prices are not Pareto efficient (bad allocation of resources).

The lemon's premium creates a wedge that maybe even more important than credit rationing itself, [a] *major pitfall in evaluating the effect of credit rationing on capital investment is that the amount of credit rationing in the economy at a given time is not readily measured* (Jaffe and Stiglitz: 1990, p. 874). The 'wedge' is the difference between the cost of internal and external funds that good firms confront. The problem with good firms is that they are not able to reveal their status (good) to banks, because bad firms are trying to fool banks by revealing themselves as good too.

There may be potential buyers of good quality products and there may be potential sellers of such products in the appropriate price range; however the presence of people who which to pawn bad wares as good wares tends to drive out the legitimate business. (Åkerlof: 1970, p. 495)

For internal funds there will be no premium, since there will be no informational asymmetries (firms will not fool themselves).

The size of internal funds will depend in part on how much outstanding debt firms have and on what the 'r' is. Investment (ceteris paribus) will be greater when internal funds are higher and borrowed funds less.<sup>12</sup> Thus, investment will be higher when the firm and the economy are financially robust.<sup>13</sup>



The difference in the cost of capital (CC) between internal and external funds will depend on the size of the wedge.

Here, investment, employment and income are more unstable under exogenous aggregate demand (AD) shocks. Investment depends on internal funds (also on collateral if considered. As the value of collateral increases the wedge decreases). A negative AD shock will affect profits (sales will decrease). Then, internal funds will decrease too (ceteris

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12. Although, internal funds depends in many things, like the debt-capital structure of the firm and aggregate demand. If the economy is growing, then profits are growing too. Also, given the interest rate, internal funds of the firm are increasing. With a low interest rate, firms pay less for the debt.

13. Investment will increase as the debt/equity ratio of the firm decreases. By using internal funds more, the conflict of interest will decrease and with that the lemon's premium. Also, if the interest rate decreases the value of assets increase (i.e., the value of collateral increases).

paribus). Thus, the cost of capital will increase and with that, investment will decrease even further.<sup>14</sup>

## **Policy**

Interestingly after presenting imperfections, non-clearing markets, asymmetric information (Dimski: 1995, p. 1) and the sort of argument that might lead you to think that some kind of intervention is needed, after all, *[t]he government only needs to know the conditions under which various sectors of the economy are likely to be allocated more or less credit than seems consistent with long term economic growth.*(Crotty: 1996, p. 3). But this is not the case, since *new Keynesian economist do not necessarily believe that active government policy is desirable* (Mankiw and Romer: 1991, p.3):

Should the government intervene and provide credit to all firms in the industry? There are costs and benefits of such an action...It is not obvious whether the benefits of such intervention exceed the costs (Fazzari: 1996, p.366).

The idea is that the government is even more inefficient and, in the long run, everything will be fine<sup>15</sup> (Mankiw: 1991, p 289). Although, government intervention is not promoted, monetary policy is challenged by New Keynesians. That is, new channels through which monetary policy operates are created.

Understanding the channels through which monetary policy affects economic variables has long been a key research topic in macroeconomics and a central element of economic policy analysis. At an operational level, a “tightening”

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14. This peculiar New Keynesian result is known as the financial accelerator.

15. A necessary condition for efficient government intervention is unobservable heterogeneity among would-be borrowers regarding the probability of default. The greater is such heterogeneity, the greater is the potential for efficient intervention

of monetary policy by the Federal Reserve implies a sale of bonds by the Fed and an accompanying reduction of bank reserves. One question for debate in academic and public policy circles in recent year is whether this exchange between the central bank and the banking system has consequences in addition to those for open market interest rates. (Hubbard: 1994, p.1)

Traditionally, the Fed changes interest rates as its mechanism for policy. But now, if the Fed increases interest rates, for example, additional things will happen. If interest rates increase the interest payments (for existing loans with variable interest payments-ceteris paribus-), will increase too. Then, internal funds will decrease.<sup>16</sup>

In the other direction, if the Fed increases reserves (a decrease in the interest rate) there is a stimulation behind the activity of the loan demand curve ( $L^D$ ). What the Fed controls is the short run interest rates, but the long run is the important variable. Most aggregate categories are not intra-sensitive to monetary policy. Empirical results show that the elasticity of investment with respect to interest rates is low, that the determinant variables are more likely to be the scale ones (i.e., income, sales) :

The success of these empirical neoclassical models could be the result of including sales, which may have little to do with the neoclassical theory, an issue which shall take up momentarily. ( Fazzari: 1993, p.11)

In other words, what drives investment is the demand for goods and not the interest rate. Then in terms of monetary policy, the Neoclassical view cannot explain why the economy inter-reacts to external shifts<sup>17</sup> (Bernanke: 1993, p. 55):

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16. If collateral is considered (the more there is, the less will be the lemon's premium), as the interest rate increases the present value of the collateral will decrease. Thus, the lemon's premium and the cost of capital increase too.

17. A second general objection to the money view is that this conventional channel seems to be too weak to account for the relatively large effects of monetary policy on spending that we sometimes observe.

While the money view no doubt contains some truth, there are a number of reasons to be skeptical that this conventional channel is the sole source of the potency of monetary policy in practice. ( Bernanke: 1993, p.55)

The pure interest rates arguments are not enough and the traditional Neoclassical path does not hold empirically<sup>18</sup> (Bernank:1993, pp. 56).

New Keynesians claim that they have solved the problem. For example, if the Fed increases the interest rates, then cash flows will decrease (given the level of debt), since interest payments increase. External funds are needed more, the cost of capital will increase and we will have the ‘wedge’ and the lemon’s premium. So there are two channels, through interest rates ( $r$ ) and through cash flows ( $cf$ ), by which investment ( $I$ ) is affected<sup>19</sup>, and [t] *he main result is that, overall, investment is significantly more sensitive to current cash flow than a frictionless neoclassical model would predict* (Gertler: 1988, p. 574).

$$I^D = \varphi_1 r + \varphi_2 cf$$

$$\frac{\partial I^D}{\partial r} = \varphi_1 + \varphi_2 \frac{\partial cf}{\partial r}$$

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18. Even more damaging to the money view, most studies find that the sensitivity to interest rates of capital spending, inventory investment, and other major categories of spending is quite low.

19. It seems like a plausible microfoundation for Minskyan models. Investment depends on the size of cash flows and financial fragility. But, following Minsky, expectations are endogenous. In expansions, people borrow more because they are more optimistic and with that the margins for safety shrink (there is a convention for a tiny cushion). Later, when optimism proves wrong, all hell brakes loose and the tiny cushions are not enough and we have panics, hysteria and all kind of emotions that a Neoclassical agent does not have. With New Keynesians, expectations are exogenous, so the mechanism here is different. Thus, it is not possible to have a Minskyan model with Neoclassical microfoundations.

Interest rates alone do not give a big impact, cash flows are also important. This is what Neoclassicals miss, according to New Keynesians<sup>20</sup> (Jones: 1993, p.75).

In a nutshell, the credit view asserts that in addition to affecting short-term interest rates, monetary policy affects aggregate demand by affecting the availability or terms of new bank loans. (Bernanke: 1993, p.56)

In the financial sector we have banks giving cash in return of a promise to pay. Here, the important matter is how good the promise is, in other words, what type of project the loan will be invested in by the borrower (how risky):

In contrast, credit (in money or goods) received today by an individual or firm is exchanged for a promise of repayment (in money or goods) in the future. But one person's promise is not as good as another -promises are frequently broken- and there maybe no objective way to determine the likelihood that the promise will be kept (Jaffe and Stiglitz: 1990, p.838).

Loans are differentiated by the likelihood of repayment and the expected return to the lender is a function of the interest rate, the promise of repayment and the likelihood of default. This type of problem has the kind of quality to be presented in a game theoretical approach. Here, the behavior of borrowers depends on the actions of lenders. The lender acts strategically and the borrower follows, the classical leader-follower model<sup>21</sup> (Bernanke: 1991, p. 302).

Banks have special activities (*the real service performed by the banking system is the differentiation between good and bad borrowers*). Bernanke: 1991, p. 302 and that is why

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20. The credit channel exist because bank loans and other forms of credit are imperfect substitutes. When banks tighten credit terms or cut off new loan activity altogether, many borrowers find it inconvenient, costly, or even impossible to find alternative sources of non-bank credit.

21. However, the bank is not able to directly control all the actions of the borrower. Therefore, it will formulate the terms of the loan contract in a manner designed to induce the borrower to take actions that are in the interest of the bank as well as to attract low-risk borrowers. (Stiglitz and Weiss: 1981, p.248)

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monetary policy have larger results than expected when only Neoclassical arguments are in play.

A growing theoretical literature, based on models with asymmetric information, stresses the importance of intermediaries in the provision of credit and the special nature of banks loans (Bernanke and Blinder: 1991, p. 327).

When small firms borrow, the quality of the loan is not transparent. Thus, banks are the specialist that deal with this type of firms that people do not know much about. Thus, banking is another channel through which monetary policy operates. When the Fed squeeze banks, it is reducing in fact banks ability to make loans. Banks are the specialist:

Many economists have suggested that banks and similar institutions play a particular central role in credit markets because of their expertise in conveying the savings of relatively uninformed depositors to uses (such as small business loans) that are information-intensive and particularly hard to evaluate. In short, according to this view, banks are “special”. (Bernanke: 1993, p.53)

If the Fed cut reserves to them, people (firms) who might get credit will not get it at all or in order to get it, they will have to pay a higher (lemon’s) premium. In any case, the Fed will cut the demand for inventories. In this sense, that is why the Neoclassical view is incomplete.

The emergence of the “credit view” in macroeconomics theory has argued for the importance of credit, and formal variables more generally, in macroeconomic outcomes. The unavoidable importance of the financial system in interpreting recent economic history has encouraged the acceptance of the credit view. It has gained stature compared to neoclassical models in which the financial system enters only in the form of the supply of money, and especially compared to abstract Walrasian general equilibrium models. ( Wolfson: 1995, p.1)

**Final Remarks**

[T]he past decade have produced an outpouring of research within the Keynesian tradition that attempts to build the microeconomic foundations of wage and price stickiness. The adjective new-Keynesian nicely juxtaposed this body of research with its arch-opposite, the new-classical approach. (Gordon: 1990 p.1115)

In the typical presentation reviewed here, following a game theoretical approach, leaders need to know a lot. They have to know the proportion of good and bad projects. they have to know the probability of expected return of each project (this information is shared between both, lender and borrowers, so both have identical information), they have to know the preference functions of good and bad borrowers (to construct the market reaction function). Thus, the leader knows almost everything<sup>22</sup>. So why call it economics of incomplete information?

[W]hile New Keynesian theorists stress the inadequacy of information available to lenders as the source of financial market “imperfections,” the analytical method used in many of the models actually requires the assumption that lenders possess information about the borrower population not available to traditional Neoclassical lenders. (Crotty: 1996, pp.4-5)

Further:

So, if Neoclassical lender can be said to have “perfect” (though stochastic) information, then the New Keynesian lender must possess information that is in some sense beyond-perfect, yet inadequate. (ibid, pp. 5-6)

Also, there is nothing within this approach about the demand side ( $L^D$ ), all is regarding the cost of capital, the lending firm, the loan supply ( $L^S$ ) side of the market. Thus, the grounds of application for these models is very limited. In the case of credit rationing,

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22. The only thing s/he does not know, in general, is which particular applicant is good and which is bad. If the leader knew this, s/he would be Neoclassical.

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contingent renewal and the harmful effects to firms's credit history is dismissed for unpersuasive reasons. Here, firms do not care about default, then, by the same token, these models should not apply where borrowers do not have truncated functions<sup>23</sup>.

The respond from New Keynesians is unclear. In the case of collateralization, the argument is not quite convincing<sup>24</sup> (Stiglitz and Weiss: 1991, pp. 261-62), since even with collateral, banks are worst off.

[W]hile increasing collateral requirement have a positive incentive effect, they could have a negative selection effect. They (Stiglitz and Weiss: 1981) argued that even if all individuals in society have the same utility functions, wealthier individuals will, in general, be willing to take greater risks (based on decreasing absolute risk aversion). Moreover, among those with large amount of wealth, there is likely to be a larger proportion of risk-takers: individuals who gambled, and by chance won. Thus, as a result of such adverse selection effect, it may not be desirable to require collateral to the point where credit rationing is eliminated. (Jaffe and Stiglitz: 1990, p.867)

Another argument presented to undermine the credit rationing logic is the multi-periods alternative that banks have. But here again there is a counter argument:

[A]n effective treat of cutting off credit may have important incentive effects on borrower behavior, causing borrowers to undertake less risky projects, thus reducing the likelihood that the economic circumstances will occur under which default is contemplated. But how can the threat of cutting off credit be may convincing? And even if one bank cuts off credit, why would not other banks provide the credit? (ibid: pp. 864-65).

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23. For example, when firms avoid default, when a collateral is big enough, for large firms and for contingent renewal. These are "one shot" models and that is why (maybe) the borrower is indifferent to default. Thus, in a multi-period situation the conflict of interest will decrease, the cost of default will increase, also, contingent renewal and reputations effects will be present.

24. An obvious objection to the analysis presented thus far is, when there si an excess demand for funds, would not the bank increase its collateral requirements (increasing the liability of the borrower in the event that the project fails) and thereby reduce the demand for funds, reduce the risk of default (or losses to the bank in the event of default) and increases the return to the bank? This objection will not in general hold.

Thus, borrowers will have banks where they want. Borrowers will become even more less afraid to default. Then banks are even worst in this situation. So, repetition even reinforces the situation:

In a multiperiod context, Stiglitz and Weiss (1981) have shown that reducing the size of the loan may have an adverse effect on the risks undertaken by the borrower; they undertake projects that in effect, “force” the lender to ante up more money in subsequent periods, if they are to recover their initial loans (Stiglitz: 1987, p.29).

Another way to eliminate credit rationing is by imposing multidimensional contract, as Jaffe and Stiglitz recognize: *[s]everal articles have suggested that credit rationing disappears when a bank can set collateral requirements and interest rate simultaneously* (p.866). Here, good borrowers will go for low interest rates with high collateral and bad borrowers will go for high interest rates with low collateral and in the process of choosing, borrowers will reveal themselves. But this logic is also challenged:

The fact that banks never have perfect information concerning the characteristics of their borrowers suggests what is wrong (or irrelevant) about this argument: the conclusion holds only if individuals differ in just one dimension (say wealth), so that a simple set of contracts can completely separate and identify the different groups. [B]ut if the groups differ in two dimensions (risk aversion and wealth), then a perfect separation cannot be made with {interest rate, collateral} contracts. Of course, if individuals differ in just two dimensions, then it might still be possible to find a more complicated contract that will perfectly identify the different groups. But so long as the dimensionality of the space of borrowers characteristics is larger than the dimensionality of the space of contracts, it seems unlikely that perfect information can be obtained. ( Jaffe and Stiglitz, pp.866-67)

The monetary policy results that emerge from the New Keynesian tradition have also been questioned:

Whether the simplest “bank lending channel” -that a fall in banks’ reserves following contractionary open market operations decreases both banks’ ability to lend and borrowers’ ability to spend- is operative is not clear,

however. More micro evidence at the level of individual borrower-lender transactions is needed to resolve this question. (Hubbard: 1994, p. 27)

And further:

While asymmetric or private information is a pervasive fact of life and of decision making in historic time, it is not necessary to non-neutrality, for even if information were symmetric and no private information existed, the prices of capital assets and current output would be determined in quite different markets and the dominant proximate determinants of the two would differ. (Minsky: 1993, 79)

But then again, the same type of contra-argument is presented:

Asymmetrical information, where the borrower knows the expected return and risk of his project, whereas the lender knows only the expected return and risk of the average project in the economy, is a particularly important case. (Jaffe and Stiglitz: 1990, p. 840)

Another puzzle with the New Keynesian approach is the name itself, in other words, what Keynes has to do with this presentation? As Gordon (1990) explains:

The essential feature of Keynesian macroeconomics is the absence of continuous market clearing. Thus, a Keynesian model is by definition a non-market-clearing model, one in which prices fail to adjust rapidly enough to clear markets within some relatively short period of time. (Robert Gordon, p.1135)

In the case of New Keynesians, Crotty (1996, pp.1-2) explains:

The distinctive New Keynesian innovations are the assumptions that: (1) information is asymmetric (AI); and (2) contracts are inherently incomplete and therefore not externally or third-party enforceable. These innovations create important differences between Neoclassical and New Keynesian models of financial markets, including the way they relate investment to finance.

So the “New Keynesian” approach (in terms of investment for example) will be “Keynesian” because investment is unstable (as exogenous shocks strike it) and because

there are financial effects that operate through investment. But this is not the case, there are serious methodological differences between the two<sup>25</sup> (Dimski: 1995, p. 16):

[T] here is a severe logical contradiction inherent in the New Keynesian assumption set. AI is a sine qua non of New Keynesian theory, but AI logically implies fundamental uncertainty [FU]. However, FU is logically inconsistent with ergodic stochastic underpinnings of the New Keynesian theory of expectations. (Crotty: 1996 , p.4)

And, as Crotty also explains:

In place of the ergodic expectations-as-knowledge fairy tale of New Keynesian theory, Keynes proposed an expectations formation process based on custom, habit, tradition, instinct and other socially constituted practices that only make sense in an environment of human agency and FU. (p.12)

Do New Keynesians will supplant Neoclassicals? Maybe they will not fill out the space. It is basically a single market analysis with out general equilibrium qualities:

Much existing new-Keynesian theorizing is riddled with inconsistencies as a result of its neglect of constraints and spillovers, and its focus on single markets, one at a time, in a partial equilibrium framework (Gordon: 1990, p.1138).

There is no analysis of out of equilibrium situations (maybe because of the reliance on game theory). The leader-follower models are inherently equilibrium models, so they will never generate out of equilibrium outcomes. The usual setup is for the analysis of a single market equilibrium, so here the questions like how a free market system operates?; how integrated market systems work?; how, if markets are out of equilibrium, could they return to it?; how do we know that it will not be chaotic?, could never be entertain.

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25. Indeed, precisely because so many New Keynesian microfoundational models seek generality by hewing closely to Walras, they may not longer deserve to be termed Keynesian.

[T]he favored “thin” approach to behavioral foundations, while analytically tractable, is neither a sufficient nor a logically consistent framework for capturing principal/agent interrelations set in real economic time. The importance of principal/ agent relations per se is not challenged -indeed, relations of this sort seem pervasive in capitalist societies with unequally distributed wealth. Nor are the relative merits of the principal/agent and (New Classical) single agent microfoundations in question (Dimski: 1995, p.1).

It is really hard to envision a paradigm that said nothing about how free integrated markets systems work, as the dominating paradigm. Here everything is quite crazy in the short run (these are short run static models), but as time goes by (long run) everything will work out fine (Gordon: 1990, p. 1136). Thus, government intervention is not needed and it could even be worst if we have interventions, since the government might be even more inefficient. So the policy implications derived from these models are vague and, if any at all, are inconsistent. Markets do not clear, but the government should not do anything about it.

On the other hand, although the domain of New Keynesians is limited, if you use their logic as an entry point for doing micro, then it has devastating results for the Neoclassical tradition:

New Keynesian theory has improved the analytical quality and empirical relevance of mainstream economic discourse. New Keynesians have: forced the profession to take incomplete information seriously; made a strong case that finance affects investment; helped create at least some degree of mainstream appreciation of the Keynes-Minsky financial fragility thesis; created serious doubt about the ubiquity of market clearing; and helped erode belief in the beatific Walrasian “Vision” of the private-market economic system. Their criticism of some of the most hallowed tenets of Neoclassical theory is particularly telling because it is largely internal to the theory; New Keynesians accept Neoclassical methodology and have adopted almost all of its core axioms. (Crotty: 1996, p.26).

It should be stressed that it is not unsatisfactory to follow this approach. The problem arises when the conclusion derived from these type of models claim to be the general case or what logic dictates. As mentioned, the New Keynesian realm has a limited applicability due to its internal construction. Thus, as long as honesty prevails, it is alright to be New Keynesian . After all, it is yet another way to disprove the Neoclassical paradigm and this time with their own logic.

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