ACCOUNTING FOR ASYMMETRIC INFORMATION AND SCREENING IN MARKET MODELS OF THE LOANABLE FUNDS AND LABOR MARKETS

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Abstract

The loanable funds and labor markets are two important markets in macroeconomics where asymmetric information is inherent and, in response, effective forms of screening have developed and become established. But many macroeconomic textbooks rely on the standard market model to characterize these markets despite its weakness at accounting for their information issues. This article suggests a simple modification to the usual market approach that acknowledges the sophisticated screening that has arisen in response to the asymmetric information of these markets. The resulting model improves upon the standard model by capturing clearly observed forms of credit rationing in the loanable funds market and unemployment in the labor market.

Introduction

The standard market model is not equipped to capture the complications that arise when a market's buyers and sellers possess asymmetric information regarding the good or service to be exchanged. But there are some important markets – for example, the loanable funds and labor markets – where asymmetric information issues have given rise to extensive screening to address the asymmetric information problems. Although signaling also takes place, it is neither as institutionalized nor as effective as the screening that occurs in these two particular markets. The asymmetric information and corresponding screening in the lending market produce what is recognized as a form of credit rationing, while the information issues in the labor market are a source of unemployment (whether that unemployment is viewed as voluntary or involuntary is a matter of interpretation, as will be addressed below). Accordingly, the information issues are relevant to macroeconomists given that both credit rationing and unemployment are widely accepted as key indicators of macroeconomic performance.

Since asymmetric information and screening are normally considered part of the microeconomic curriculum and under the domain of microeconomic textbooks, macroeconomic textbooks that introduce the loanable funds and labor markets are confronted with a choice. Do they step back and quickly introduce the topics of asymmetric information and screening so as to prepare students for a more comprehensive discussion of these two critical markets, or, do they ignore the concepts and do the best they can without them?

Some textbooks seem to implicitly (although not explicitly) concede that the information issues render the market model inappropriate by not presenting the market diagrams of either the loanable funds or the labor market (e.g., macroeconomic textbooks that do not include either a loanable funds or labor market diagram include Blanchard, 2013; Case and Fair, 2014; and Shiller,

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2016). Of the rest that depict one or both of the important markets – however imperfectly – in the standard market model, any discussion of how asymmetric information and screening influences the important markets is not common (textbooks that present the loanable funds market as well as those that introduce the labor market this way are noted below).

The decision to present the loanable funds and labor markets using the market model without mentioning the effects of screening reflects a willingness to overlook credit rationing and unemployment. What is the source of this willingness? Is it simple practicality, i.e., are the benefits of having basic market model analysis when introducing these two important markets worth the costs of overlooking the effect of their asymmetric information issues and the screening that ensues? Does the willingness come from a belief that the asymmetric information is sufficiently countered by the associated screening (and signaling) to confirm the standard market approach? Perhaps confidence in the standard market analysis at the root of much of economic thinking leads many economists to discount the asymmetric information problems since they are not captured by the standard market model. Or, is it more accurate to say that all three of these explanations apply to some extent and have even been mutually-reinforcing?

Interestingly, the same screening that identifies quality trading partners in both the loanable funds and labor markets necessarily distinguishes those who are viewed as less reliable and, therefore, unable to take part in a trade. Anyone misperceiving these latter folk as viable participants in the market will likely misinterpret their lack of success as evidence of a market failure where none exists. Of course, whether or not a market failure is perceived influences most economists' recommended government policies for that market, and especially so for markets as important to the economy as the loanable funds and labor markets.

This paper presents a modified market model that provides more comprehensive and cogent depictions of the loanable funds and labor markets by accommodating the asymmetric information and, importantly, the screening that exists in each market. Granted, the dependable screening in these markets is so expected and commonplace that it can seem strange to conceptually separate it from the other forces that shape the markets. But benefits to the approach include a helpful and remarkably accurate characterization of much of the credit rationing observed in the lending markets as well as of unemployment in the labor markets.

The Loanable Funds Market

Many macroeconomic textbooks present the loanable funds market in which the downward sloping demand captures the behavior of would-be borrowers and the upward sloping supply represents lenders' behavior (this includes textbooks by Hubbard and O'Brien, 2015; Krugman and Wells, 2012; and Mankiw, 2015). The model implicitly assumes away the presence of screening that counters asymmetric information, thus allowing the simple market analysis to identify an equilibrium interest rate and equilibrium loan volume. There is no mention of asymmetric information or screening in the accompanying text (nor of the possibility that the outcome would frustrate some attempting to participate in the market as with credit rationing). Other textbooks – particularly Intermediate Macroeconomic texts – present the same underlying theory using the saving and investment schedules in the context of a closed economy (e.g., Abel, Bernanke, and Croushore, 2014; Mankiw, 2013; and Mishkin, 2015; with Frank and Bernanke, 2012; being an example of an introductory textbook). The determination of the interest rate and

the quantity of saving and investment is theoretically equivalent to that of the loanable funds approach and, again, there is no accompanying mention of screening or credit rationing.[2]

However, lending is complicated by asymmetric information as lenders do not necessarily take borrowers' promises to repay at their word. Instead, they screen prospective borrowers to better ascertain whether they are trustworthy. This screening takes the form of interviewing would-be borrowers, investigating their credit and work histories, and verifying their financial conditions, all of which have proven to be very effective and have become standard practice by lenders. Given the overall demand for loanable funds by willing borrowers (D), the screening allows lenders to discern a subset of D that they deem to represent the trustworthy borrowers, referred to here as the verified demand (D_V). The horizontal distance between D and D_V represents the willing borrowers who are not deemed reliable to pay back loans. Figure 1 depicts the loanable funds market in which D and D_V are both shown.

Figure 1
Loanable Funds Market
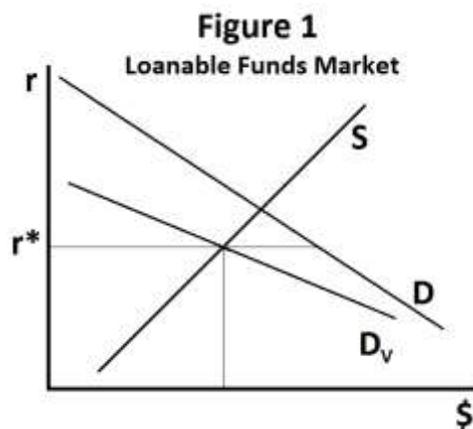
Note that while there is no explicit recognition of the screening costs absorbed by lenders in Figure 1, the specified supply curve (S) is assumed to represent those costs. Thus, the modified market model assumes that lenders routinely incur screening costs and that the screening only informs lenders – as opposed to convincing many would-be borrowers – as to the unreliability of those would-be borrowers. Accordingly, changes in screening costs shift S, e.g., an increase in screening costs causes a decrease in S. Also, an increase in the efficacy of screening for a given screening cost has no effect on D, but could shift the D_V curve either in or out depending on whether the improved screening identified fewer or more trustworthy borrowers, respectively.

It is true that hopeful borrowers realize that they need to be seen as trustworthy by lenders to secure a loan and will try to signal their reliability. Any information they convey to lenders beyond what lenders have ascertained by their screening will affect the lenders perception of D_V. Furthermore, borrowers can often screen lenders and lenders can signal the quality of their service (e.g., through advertising), both of which could cause borrowers to differentiate between lenders who can be expected to perform up to a certain standard and lenders who cannot. This would call for specifying a verified supply of loanable funds in addition to the declared supply of loanable

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[2] Whereas borrowing for either consumption or government purchases adds to the demand for loanable funds and constitutes dissaving in the saving/investment framework (for example, government deficits increase the demand for loanable funds whereas they shift the saving schedule to the left), their theoretical impact on the interest rate and level of investment is identical under both approaches. Similarly, although investment financed from investors' own savings would not show up in the loanable funds market, the demand and supply of loanable funds would differ from the investment and saving schedules (respectively) by the exact same amount, so that both approaches identify the same equilibrium interest rate.

funds in a way comparable to what is done for the demand. But it is assumed here that the asymmetric information and the effects of these forms of screening and signaling are negligible relative to the impact of screening by the lenders in the loanable funds market, so that Figure 1 only presents the supply of loanable funds (S) without distinguishing any different supply that has been verified by prospective borrowers.

Assuming that there are many lenders with the same screening abilities and costs, as well as many verified borrowers, means the competitive equilibrium interest rate (r*) is determined by the intersection of the supply of loanable funds (S) and D_V (as shown in Figure 1). These are the relevant curves because those supplying funds and those qualifying to borrow constitute the market participants that agree on the item that is exchanged and, through their actions, bring about market clearing.[3] However, unlike the traditional loanable funds diagram that does not distinguish between D_V and D, Figure 1 reveals the amount of loanable funds at the equilibrium interest rate that borrowers who lack the confidence of potential lenders would like to borrow.[4] Lenders turning down willing borrowers at the going interest rate meets one simple definition of the economic phenomenon known as *credit rationing*, where the volume of credit rationing is shown by the horizontal distance between the D_V and D curves at the equilibrium rate.[5]

Note that this modified loanable funds market model maintains the usual analysis available from the traditional model, plus it captures the effects of shocks that affect D_V and D differently. For example, an increase in the risk perceived by lenders, or a reduced appetite for risk by lenders, causes them to be more reluctant to validate loan requests, shifting D_V in without moving D.[6]

The concept of credit rationing has received the most attention in the macroeconomic literature due to its role in the credit channel of monetary policy. Following Bernanke's (1983) influential paper on how the destruction of "information capital" and the "malfunctioning of the financial institutions of the early 1930's" were significant contributors to the Great Depression, the means by which monetary shocks disrupt the provision of credit and influence macroeconomic

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[3]   Because the supply curve represents the lenders' behavior and the D_V curve represents the perceptions of those same lenders (regarding the trustworthiness of the borrowers), one might suspect that the model specifies lenders with market power that is not present in the traditional representation of the loanable funds market. But this is not the case. The assumption that there are many lenders of equal screening abilities as well as many verified borrowers assures that the lenders operate in a competitive environment. To corroborate this claim, consider lenders who – believing they have market power – try charging an interest rate above the competitive rate identified in Figure 1. The presence of many lenders competing with each other would lead to an excess supply of loanable funds, and market forces would return the interest rate to the competitive equilibrium that is shown.

[4]   The flatter slope of the verified demand curve relative to the demand curve in Figure 1 depicts the case in which the number of willing borrowers who do not qualify for loans rises with the interest rate.

[5]   There are more precise definitions of credit rationing.   In Stiglitz and Weiss's (1981) seminal paper, "credit rationing" occurs due to asymmetric information that is unresolvable by screening or signaling, i.e., it assumes away the issue of unreliable borrowers who are precisely the credit rationed identified in the modified market model introduced here. They assume that all borrowers are equally dependable, yet show that some would be denied credit at the going interest rate (and, therefore, credit rationed) due to lenders' responses to the asymmetric information. It is important to be clear that the credit rationing investigated by Stiglitz and Weiss of dependable prospective borrowers is not captured by the model presented here which, instead, depicts the credit rationing of those who have been shown to be unreliable prospective borrowers by successful screening (which is not a concern of Stiglitz and Weiss). It is also important to recognize that these two types of credit rationing are not mutually exclusive. Both could be present in an economy.

[6]   An alternative perspective on D_V is that it captures lenders' behavior in reaction to their expectations – e.g., their perceived mean and standard deviations – regarding the borrowers honoring their debt obligations. In this case a greater standard deviation would cause the (presumably risk averse) lenders' D_V to shift to the left in a similar way to that just discussed. The assumption of risk averse lenders assures that their operational D_V will not be outside (i.e., to the right) of the D curve.

performance was identified as the "credit channel of monetary policy" (Bernanke and Gertler, 1995).

The credit channel of monetary policy actually consists of two component channels, both of which depend on credit rationing:

1) The *bank lending channel* in which monetary policy alters the relationships between potential debtors and creditors and, in so doing, alters the success of screening at alleviating asymmetric information problems. For example, small borrowers who have developed relationships with particular lenders over the years (i.e., the lenders have gathered sufficient information regarding the reliability of the borrowers to willingly lend to them) can be stranded when their usual lender is short of available funds due to a contractionary monetary policy. Whereas the large borrowers may have sufficient reputations to be quickly considered creditworthy by multiple lending institutions, small borrowers often look too risky for creditors not already familiar with them. Accordingly, contractionary monetary policy creates conditions where potential borrowers, because they must ultimately rely on other creditors that do not know them well, are effectively transformed from verified demanders of loanable funds to unverified demanders.

2) The *balance sheet channel* in which monetary policy changes the price of assets and, therefore, the balance sheets and perceived creditworthiness of potential borrowers. For example, contractionary monetary policy raises interest rates, thereby reducing asset values including those assets owned by potential borrowers. The resulting harm to the potential borrowers' net worth reduces their overall creditworthiness in the eyes of possible lenders, not just because of the fall in the value of assets that could serve as collateral, but because less healthy balance sheets increase the likelihood of default and bankruptcy.

Thus, while contractionary monetary policy is correctly represented as a decrease in the supply of loanable funds that raises interest rates, both the bank lending and balance sheet channels explain how contractionary monetary policy also causes D_V (as in Figure 1) to shift to the left without necessarily altering D. The shift in D_V counters the effect of the decrease in supply of loanable funds (from the contraction in the money supply) on the interest rate, however, it reinforces the decrease in supply's effect on the equilibrium quantity of lending and it increases the amount of credit rationing.

Another important type of shock to D_V that is adeptly captured by the modified model is a change in risk aversion by banks. The model predicts that a negative shock to "bank confidence" (perhaps brought on by a recession) will shift D_V in causing low interest rates, less lending, and increased credit rationing. This explains the coexistence of these conditions, sometimes viewed as a puzzle since low interest rates are normally thought to promote more borrowing and since interest rates are expected to be bid up by the apparent excess demand for funds reflected by the many credit rationed would-be borrowers.

It is particularly noteworthy that the modified model significantly improves upon the standard model in capturing events in the private loanable funds market during the recent Great Recession. The volume of borrowing/lending plummeted which, per the traditional model, would only happen with a decrease in demand and/or a decrease in supply of loanable funds. Reports from the financial sector during this period strongly attributed the cause of the low lending to a decrease in creditor participation as they commonly referred to credit markets as "frozen" or "dried up" or suffering from a "credit crunch." (Many macroeconomic textbooks discuss the credit problems of this period: Able, Bernanke, and Croushore, 2014, pg. 564-5; Dornbusch, Fischer and

Startz, 2014, pg. 422; and Mankiw, 2016, pg. 334.) But the suggested decrease in supply of loanable funds rather than a decrease in would-be borrowers demanding them would have caused higher interest rates, and that was not observed. Alternatively, the increase in risk during this period decreased the supply of funds in private markets (and caused increases in the spreads between private rates and the government risk free rate), but this decrease in supply was overpowered by the increase in supply from ample monetary expansion that lowered the government rate (increasing the supply of funds in the private lending markets as lenders turned to them for the relatively higher returns). The resulting net increase in supply of private loanable funds leads conventional financial market analysis to predict the low interest rates that were observed, but it also predicts greater loan volumes as opposed to the contraction in lending that took place.

In contrast, the new model presented here can incorporate the increase in credit rationing that occurred. In the aftermath of the popping of the housing and bond bubbles creditors became more risk averse and, accordingly, adopted higher standards for validating prospective borrowers, causing D_V to shift left. This not only explains the drop in lending that occurred and is consistent with the narrative that creditors were not showing up, but it is also consistent with the low interest rates that accompanied the low lending.

The Labor Market

Another very important market presented in macroeconomic textbooks with the help of a market diagram is the labor market (Abel, Bernanke, and Croushore, 2014; Frank and Bernanke, 2012; Hubbard, O'Brien and Rafferty, 2012; Mishkin, 2015; and Williamson, 2014).[7] This market is also subject to asymmetric information issues that have given rise to well-established screening activities, rarely acknowledged in the discussion accompanying the market model. Specifically, since the quality of labor that a particular job applicant would deliver is not immediately apparent to those who demand labor, prospective employers rely on interviews, recommendations, proof of experiences, internships, and other forms of screening to provide confidence in the quality of the labor offered. Successful signaling by those hoping to be hired will provide better information to employers. Accordingly, Figure 2 shows the labor market where the supply of labor (S) is distinguished from the supply of labor that has been verified as acceptable in the eyes of the employers who demand it (S_V).

Figure 2
Labor Market

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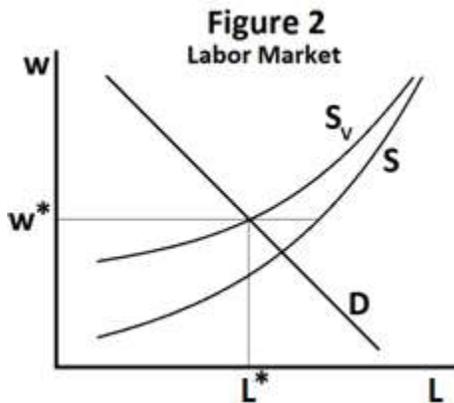
[7]   Interestingly, some textbooks limit their use of labor market diagrams to the examination of the effects of minimum wage laws (Colander, 2013; Frank and Bernanke, 2012; Hubbard and O'Brien, 2015; Krugman and Wells, 2012; and Mankiw, 2015), presumably because the unemployment caused by the price floor (when binding) is easily depicted, in contrast to unemployment stemming from other factors.

As with the previous discussion on the loanable funds market, the model in Figure 2 might seem to overlook issues such as the employers' screening costs and any asymmetric information regarding the employers' behavior. But the screening costs experienced by employers can be thought of as reflected in the employers' demand (so that, for example, greater screening costs would shift the demand curve for labor in). And while screening by potential employees (e.g., checking out the reputations or safety records of employers) and signaling by employers (e.g., advertising their working conditions) certainly exist, these efforts are relatively ineffective at reducing asymmetric information compared to the common screening undertaken by employers. This means that the difference between D_V and D is relatively small compared to that of S_V and S. The model presented in Figure 2 accentuates that relative difference by not differentiating between D_V and D at all, although specifying a small difference is straightforward and does not alter the analysis below in any significant way.

Figure 2 illustrates the market clearing quantity of employment and competitive equilibrium wage as determined by the demand and verified supply of labor, which are the relevant forces in this market.[8] As shown by Figure 2, the number of people wanting to work at the equilibrium wage exceeds the number hired, giving rise to unemployment.[9]

A major debate in economics regarding unemployment is whether unemployed people are *involuntarily unemployed* or *voluntarily unemployed*. Keynesian theory argues that cyclical unemployment (which it distinguishes from the natural rate of unemployment) is largely involuntary and caused by sticky wages. This is depicted easily in a labor market diagram by a wage remaining stubbornly too high to clear the labor market and, thus, causing an excess supply of labor that constitutes involuntary unemployment. Explanations of such sticky wages include minimum wage laws, unions, and explicit and implicit labor contracts.

Other explanations of why wages exceed a market clearing level and generate involuntary unemployment come under the category of efficiency wage theories. Whereas efficiency wage theories explain unemployment as a consequence of asymmetric information, they do so without considering the impact of any screening. Therefore, the unemployment identified here is very different because it completely depends on successful screening in the labor market.[10] Notably, the focus on this latter type of unemployment below should not be inferred as a denial that the unemployment due to efficiency wages can and does occur concurrently.

In contrast, Classical theory views unemployment more simply as the result of potential workers not yet finding and accepting employment opportunities. This includes those who do not accept available jobs believing – correctly or not – that there is a better employment fit with better compensation yet to be found. This latter form of unemployment is explained by search theory,

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[8]   A comparable issue to one addressed in the loanable funds market arises in that those demanding labor in this market and those validating the worthy component of the supply are the same agents, which naturally causes concern about the possibility that those agents (i.e., the employers in this case) possess market power. But a similar screening process by employers does not give any one of them market power as long as there are many of them. Again, a thought experiment is helpful: If employers were to offer a lower than market-clearing wage, then there would be a shortage of qualified workers and market forces would drive the wage up to its equilibrium.

[9]   It is important to note that there are other markets with asymmetric information regarding the quality of the good being supplied where the unverified supply is discounted promptly enough to prevent it from being interpreted as an excess supply – such as the used car market. In this case, used (unverified) cars are better cast as imperfect substitutes for the verified cars in the same way that risky bonds are imperfect substitutes for risk-free bonds. Thus, the unverified cars, like the risky bonds, sell at a lower price than the more certain alternatives.

[10]   Efficiency wage theories are at least mentioned in most intermediate macroeconomic texts (Abel, *et al*. 2014; and Mankiw, 2016). Also, see Shapiro and Stiglitz (1984) and Summers (1988).

which examines the decision of potential employees to either accept or deny job offers. Of the few undergraduate macroeconomic (as opposed to labor economics) textbooks that include some search theory, it normally doesn't extend past assuming a "reservation wage" required by a worker before accepting a position. Actual search models are presented even more rarely, and then it is the reservation wage, the duration of the job search, or the unemployment rate that is specified as endogenous as opposed to the quantity of unemployed as in the market model.[11] It is not surprising that people searching to find more desirable jobs (as opposed to settling for lesser jobs) see themselves as involuntarily unemployed, yet Classical thinking considers them to be voluntarily unemployed and, therefore, not an excess supply of labor.

Search theory is incorporated into the standard market model for labor through its effect on the labor supply curve. For example, an increase in people's reservation wages is represented as a decrease in labor supply (i.e., a shift left of the labor supply curve). Accordingly, including the assumptions of search theory does not alter the interpretation of the labor market model as long as one then notes that those people still searching for employment who think they are unemployed – and who may be reported on the evening news as being so –are unemployed voluntarily.

The supply curve specified by the modified market model in Figure 2 (S) effectively captures the same Classical thinking regarding the supply response of potential workers to wage offers by employers, so that the self-proclaimed involuntarily unemployed people searching for satisfactory jobs form the labor supply just as they do with the standard model. But only those who have been identified and validated by employers to offer the required quality of labor constitute the verified labor supply (S_V). Note that the unemployment associated with search – which is not visible in either model but is acknowledged in the construction of their supply curves – is independent from the unemployment caused by the employer screening that distinguishes the verified labor supply. In other words, those who are unemployed because they have not yet accepted employment at the going wage are different from those who would be offered and accept work at that wage if an employer would validate them as fit to be hired.

Whereas Classical thinking clearly identifies those who do not accept employment as voluntarily unemployed, its perspective on the unemployment associated with employer screening is less definitive. One could reasonably argue that those who would be competent workers without yet having their abilities validated are involuntarily unemployed and, simultaneously, maintain that those who offer their labor thinking – incorrectly – that they are able to provide the quality of labor demanded by employers should be considered delusional as opposed to involuntarily unemployed. More practically, whether labeled involuntary or not, both sources of unemployment are evident in the economy and the modified model's ability to capture that observed phenomenon is a strength when compared with the standard model.[12]

In addition to recognizing unemployment regardless of whether it is voluntary or involuntary, the modified model improves upon the standard model of the labor market by being able to examine the effects of structural shocks that affect S and S_V differently. As one example, laws that make it more difficult to fire employees (for example, as found in France) increase the costs of hiring poor performing employees and, accordingly, increase the degree to which job

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[11]   Blanchard (2013) is an intermediate macroeconomic textbook and Colander (2013) and Frank and Bernanke (2013) are introductory macroeconomic textbooks that distinguish themselves from most other textbooks by introducing the notion of a reservation wage. Dornbusch, Fischer, and Startz (2014) is an even greater exception among intermediate macroeconomics textbooks in that it mentions search theory, while Williamson (2014) develops it more formally. Although matching theory – which can be seen as an extension of search theory – could be applied to the labor market as well, no undergraduate macroeconomic textbooks that did so were found.

[12]   This does not exclude the possibility that sticky wages also affect the labor market.

applicants' labor services need to be screened and verified in order to satisfy employers. The desire for more thorough screening shifts S_V in without moving S, causing lower employment and greater unemployment, although those who secure jobs make higher wages. This is consistent with the French experience where the difficulty in firing workers is often blamed for France's high unemployment rate, yet France's worker productivity is one of the highest among OECD countries.[13]

Notice that Figure 2 depicts a supply curve that becomes more inelastic as the quantity of labor supplied becomes greater. This captures the decreasing effect that a higher wage has on the quantity of labor supplied as additional potential laborers become more scarce. The figure also depicts a narrowing of the distance between S_V and S as the quantity supplied increases. This would be the case if – as labor becomes more scarce – employers become less picky about those they hire. This predicts the observed result that an increase in labor demand due to economic expansion causes unemployment (seen as the distance between S_V and S at the equilibrium wage) to fall.[14]

The Relative Value of the Modified Model

Since the modified model presented here is only meaningful when a market experiences significant screening, its only potential value is in analyzing those markets. Although such markets may be few, the two discussed here are critically important to basic macroeconomics, and their importance would seem to make room for the modified model to be valued. Still, the decision of whether to employ the modified model to assess those two markets depends on the perceived benefits and costs associated with the new model. Those will likely be weighted differently by different economists.

Both the standard model and the modified model capture the determination of equilibrium prices and quantities of the markets they are investigating. But the standard model is oblivious to the screening done in the loanable funds market and, therefore, doesn't even hint at the existence of credit rationing. The standard market model of the labor market that ignores screening can illustrate unemployment due to either a binding minimum wage or sticky wages by assuming a wage above the equilibrium wage. But it doesn't divulge any unemployment resulting from asymmetric information and the associated screening in the labor market.

Thus, one's valuation of the modified model presented in this paper greatly depends on its perceived advantages in conveying the phenomena of credit rationing and unemployment. It would not be surprising for some to find the complete independence of credit rationing from the loanable funds market (as under the standard model) unsatisfactory.[15] For example, they might be concerned that the model's implicit denial of something as evident as credit rationing could generate doubts about the model more generally. Others could reasonably prefer to use the standard model to present the equilibrium price and quantity of credit, and feel comfortable admitting that credit rationing is a complication not captured by the standard market analysis. Similarly, some may feel that the standard labor market diagram misses (or even hides) a type of unemployment that they believe is commonly observed in the economy and, therefore, important to acknowledge. Rather than try to explain the unemployment outside of the standard labor market

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[13] Of course, French after-tax wages are not as impressive due to high French taxes.

[14] Even if the horizontal distance between S_V and S was constant across wages, then an increase in the demand for labor that increased employment would reduce the unemployment *rate*.

[15] As pointed out in the Introduction, it is not uncommon for undergraduate macroeconomic textbooks to forego the standard market model of the loanable funds or the labor markets in their presentations of those markets.

analysis and possibly face questions about how the analysis overlooks it, one could find it worthwhile to specify the modified model, because it recognizes and depicts that unemployment. Others could choose to continue presenting the unemployment generated by screening as something outside of what the standard labor market diagram portrays.

Perhaps it is most important to note that the two models are not mutually exclusive and that both could be used effectively in presentations of the loanable funds or labor markets, i.e., it is quite possible to first present either market with the standard market model and then introduce the effect of screening with the modified model.

Conclusion

This paper suggests very simple alterations to the traditional market model to capture effective and widespread screening in two critically important markets where asymmetric information is a complicating factor: the loanable funds market and the labor market. In each case, the modified model presents market clearing and, in addition, some evident and important features of the market that the traditional market model fails to take into account. Specifically, the new model's depiction of the loanable funds market captures a commonly recognized form of credit rationing, while its version of the labor market clearly shows unemployment distinct from any unemployment attributed to sticky wages.

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