



Monetary policy, endogenous transactions, and financial market segmentation [☆]



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ARTICLE INFO

Article history:

Received 15 June 2014

Accepted 18 March 2015

Available online 9 April 2015

JEL classification:

E4

E5

G1

Keywords:

Money

Credit

Endogenous financial market activity

Monetary policy

ABSTRACT

An endogenous financial market segmentation model is constructed to explore the role of costly credit as a medium of exchange in the monetary policy elasticity of financial market activity. Against inflation risk, credit is an alternative insurance device to a cash transfer from the financial market. In equilibrium, credit reduces the financial market activity rate. Monetary policy has redistributive effects across economic individuals. Inflation may tax financial market non-participants. However, it may tax financial market participants by increasing the financial market activity rate. Welfare may increase and the optimal money growth rate can be positive.

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1. Introduction

The objective of this paper is to explore the role of costly credit in the monetary policy elasticity of financial market activity¹ in order to answer two questions: (1) how do the coexistence of cash and credit interact with a financial market activity against inflation risk? (2) why is the financial market participation rate low?² Credit has two roles in the economy: a medium of exchange and an insurance device. Economic individuals may spend more on credit to meet their liquidity demand against inflation risk instead of transferring cash from the financial market.

Due to recent payment system improvement, credit has been prevailed in market transactions.³ By using credit, the demand for cash would decrease and less savings could be liquidated from a financial market. The financial market activity rate is likely to decrease. Therefore, credit would potentially have an effect on both goods market transactions and financial market activity.

[☆] I am very grateful to my advisor, Steve Williamson for his invaluable comments and guidance. I am also very grateful to Gabriele Camera, Youngsik Kim, Manjong Lee, Jae Eun Song, Tack Yun, and Chul-Hee Kim for their helpful comments. This work was supported by the National Research Foundation of Korea Grant funded by the Korean Government (NRF-2014S1A5A8012455). All errors are mine.

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¹ In this paper, the financial market will represent the government bonds market and its activity is the economic individuals' transactions rate of a period.

² According to the Survey of Consumer Finance for 2010, 12.2% of families held certificates of deposit and its ownership fell 7.7% between 1989 and 2010. Only 14.9% and 1.6% held savings bonds and other bond and they had been in the downward trend since 1989.

³ In Gerdes (2008), the annual rate of change in the number of general purpose credit cards rises by 7.6% between 2003 and 2006 and that in the nominal value rises by 9.9 percent. In 2006, about 20 percent of the number of transactions are made with credit cards and 2.5% percent of the nominal value is paid by credit cards.

As introducing the financial market activity in an endogenously segmented market framework with credit, this paper expands the study about the credit card debt puzzle including Gross and Souleles (2002), Telyukova and Wright (2008) and Telyukova (2013), where some U.S. households hold not only significant amount of credit card debt but also liquid assets including cash and savings.⁴ In Telyukova and Wright (2008), they provide a theoretical framework to discuss the credit card debt puzzle in steady state. In Telyukova (2013), she quantitatively evaluates the demand for credit and liquidity assets to explain the puzzle. However, they leave out a financial market activity, which can make an explicit channel to the substitution between credit and liquid assets against inflation risk, and monetary policy implications in the short run.

Models of an endogenously segmented financial market include Chatterjee and Corbae (1992), Alvarez et al. (2002, 2009), Khan and Thomas (2011) and Chiu (2014). Generally, money is only medium of exchange and economic individuals decide to participate in the financial market to transfer cash for consumption against risk. In Alvarez et al. (2002), the financial market is endogenously segmented due to of idiosyncratic endowments, but in Khan and Thomas (2011), it is due to idiosyncratic financial market participation costs. They study the short-run effects of monetary policy on the persistent inflation and liquidity effects, exchange rate, sluggish price adjustment, and velocity of money instead of the policy effects on the choice of multiple means of payments and the elasticity of financial market activity.

Moreover, in a cash-credit economy, credit could be a better insurance device than a cash transfer if economic individuals are inclined to avoid a smaller liquidity share arising from an excessive financial market participation. Depending the policy elasticity of financial market activity, inflation may tax even active financial market participants who transfer cash and decrease the market activity rate.

There is a set of multiple means of payments literature including Choi (2011) and Breu (2013).⁵ In Choi (2011), when the bonds market is exogenously segmented credit may improve welfare by dampening the fluctuations of consumption against inflation. On the other hand, in Breu (2013), when the credit market is exogenously segmented, credit is not such an effective instrument and decreases welfare. Although Choi (2011) and Breu (2013) deliver interesting results, exogenously segmented markets keep them from analyzing the policy elasticity of financial market activity.

This paper is built on Alvarez et al. (2002) in an element of Freeman and Kydland (2000) that is analytically tractable. There is a unit mass of households and each household receives different constant amount of endowments. In each period, when the financial market opens, the household decides whether to participate in the market by paying a fixed fee or not. The financial market participants are called *traders* and the others are *nontraders* who stay inactive. Traders transfer cash from the financial market by exchanging money and one-period government nominal bonds. The government implements monetary policy through open market operations. In the goods market, a shopper purchases consumption goods by using cash or costly one-period credit. There are two costs of credit: a fixed transactions cost and the nominal interest rate of the government bonds for a borrowing cost.

In equilibrium, with credit, the financial market activity rate is smaller than one without credit. The share of the money injection for traders decreases with the financial market activity rate. Money is nonneutral and monetary policy has the asymmetric distributional effects between traders and nontraders through the changes in aggregate money demand and nominal interest rate. Suppose inflation decreases the borrowing cost of credit under certain condition. Then, first, inflation may not tax nontraders even if they decide not to transfer cash from the financial market. Credit is used for a greater variety of goods and consumption with cash increases. Thus, total consumption increases. Next, unlike Alvarez et al. (2002) and Khan and Thomas (2011), inflation may tax traders. The financial market activity rate increases to transfer cash. Cash is used for a greater variety of goods and consumption with cash increases. However, due to lower return on nominal bonds, total consumption decreases. Thus, depending on the distributional effects on the cash-credit choice and financial market activity flows, there may be no welfare cost of inflation and the optimal money growth rate is positive.

The remainder of the paper is organized as follows. Section 2 describes the basic economic environment of the model. Section 3 discusses equilibrium results. Monetary policy implications without credit and with credit are studied in Sections 4 and 5. Section 6 concludes.

2. The model

Time is discrete and indexed by $t = 0, 1, 2, \dots$. There is a continuum of infinitely lived households with unit mass indexed by $j \in [0, 1]$. Each household consists of a shopper, a worker, and a financial transactor as in Williamson (2005). A shopper purchases consumption goods from workers of other households in a goods market. A financial transactor facilitates transactions in a financial market.

There is a continuum of consumption goods in spatially separated markets indexed by $i \in [0, 1]$. The household has preferences given by

$$U(\{c_t(i)\}_{t=0}^{\infty}) = \mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t \left(u \left[\min \left(\frac{c_t(i)}{2i} \right) \right] - \gamma_t \right), \quad (1)$$

⁴ According to the 2010 Survey of Consumer Finance, 39.4% of families carried credit card balances and 94.0% of U.S. families owned any financial asset. Specifically, 92.5% of them owned some type of liquid transactions accounts, for example, checking, savings, and money market deposit accounts.

⁵ Also, see Ireland (1994), Lacker and Schreft (1996), Aiyagari et al. (1998), Freeman and Kydland (2000), He et al. (2005, 2008), Bolt and Chakravorti (2007), Alvarez and Lippi (2009) and Williamson (2009).

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