

Collateral and growth cycles with heterogeneous agents[☆]Stefano Bosi^a, Mohanad Ismael^b, Alain Venditti^{c,*}^a EPEE, University of Evry, France^b Birzeit University, Al Birah, Ramallah and AlBireh, Palestinian Territory^c Aix-Marseille University, (Aix-Marseille School of Economics)-CNRS-EHESS & EDHEC Business School, France

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ABSTRACT

We investigate the effects of collateral and monetary policy on economic growth within a Ramsey equilibrium model where agents have different discount factors. Introducing liquidity constraints in segmented markets where (poor) impatient agents without collateral have limited access to credit, we study their implications in terms of welfare and business cycles (based on deterministic cycles through bifurcations and self-fulfilling prophecies). We find that an accommodative monetary policy may be growth-enhancing and welfare-improving (through the inequality reduction) while making unpleasant fluctuations more likely. Conversely, a regulation reinforcing the role of collateral and tempering the financial market imperfections may stimulate the economic growth while pursuing the goal of stabilization.

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1. Introduction

The financial crisis of 2007–2008, better known as subprime (mortgage) crisis, led at the very end to credit tightening and economic slowdown in the U.S. and Europe. The drop in the value of collateral, the securitization of bad credits and the spread of toxic assets promoted a liquidity crisis together with financial and real markets instability. Two main ingredients are at the origin of such a global crisis: a strong development of subprime loans distributed to households with insufficient collateral and new banking practices with respect to risk based on insufficient banks' own funds. American and European governments and central banks have then decided to increase the collateral constraints to both households and banks to avoid bad credits, and to supply money to offset the lack of liquidity. However, besides the problems related to sovereign debts, the effects of these policies on the growth rate have been contrasted. While the U.S. recovers today its pre-2007 growth rate, most European countries have experienced a lasting stagnation or even recession.

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In particular, the quantitative easing policy first implemented by the US FED and then by the European Central Bank since September 2012, which has significantly increased over the last months, has clearly provided liquidities in the economy in order to support investment and consumption but it is claimed to generate some instability in the financial markets. Maintaining the interest rate close to the zero lower bound, this policy provides strong incentives to agents to invest in assets and may generate bubbles disconnected from the real side of the economy. Over the last year, the FED has decided to weaken its quantitative easing policy and the volatility has indeed significantly increased in the financial markets, agents expecting some possible increase if the interest rate. An additional regulation policy aiming at affecting consumption and investment decisions could then be appropriate in order to rule out fluctuations.

To address these questions, we consider an endogenous growth model. We study the stability issue of growth rate dynamics taking in account the role of collateral in a monetary economy with credit market imperfections and agents with heterogeneous discount rates. Agents pay cash a part of their consumption purchases and on credit the remainder whose extent depends on the amount of collateral understood in a broad sense as depending on both physical and human capital. Such an assumption captures the increased restrictions recently faced by households when accessing credit as financial intermediaries require collateral guarantees based at the same time on the stock of physical capital owned by households and on their potential wage rate which depends on their stock of human capital. Depending on their discount rate, agents are differently affected by these constraints.¹ We aim at understanding the role of collateral in the occurrence of economic crises (viewed as self-fulfilling prophecies) and making policy recommendations to stabilize the economy and possibly reduce social inequalities. As the quantitative easing increases the liquidity, we will focus on the consequences of money creation by the central bank.

We consider a credit constraint, formulated as an extended cash-in-advance constraint, similar in spirit to the one considered by Kiyotaki and Moore (1997). We assume that consumers may borrow to consume more than the cash they hold but they are constrained by the amount of collateral they own. Similarly to Kiyotaki and Moore (1997), we show that the credit constraint promotes the emergence of endogenous fluctuations. Depending on whether this constraint is binding for all agents or only a part of them, we get two different regimes: the one with expectation-driven fluctuations based on equilibrium multiplicity (sunspots); the other without transitional dynamics based on a unique equilibrium, the Balanced Growth Path (henceforth, BGP). Although we do not consider a micro-founded formulation based on monetary search models à la Lagos and Wright (2005), our results look similar to the main conclusions by Ferraris and Watanabe (2008); 2011). Embedding a credit model à la (Kiyotaki and Moore, 1997) into a search model à la (Lagos and Wright, 2005), these authors show that larger fluctuations arise when the credit constraint is binding and agents are at their borrowing limit.²

We focus on agents' heterogeneity. They have different discount rates, cannot borrow against future labor income, but are allowed to pay a part of current consumption on credit if the collateral is positive. We know that heterogeneous discounting catalyses the accumulation of capital in the hands of the most patient agents (henceforth, the capitalists). If individuals are permitted to borrow against future income, the impatient agents borrow from the patient ones and spend the rest of their life to work in order to refund the debt. In the spirit of Becker (1980), Becker and Foias (1987; 1994), but in contrast to Le Van and Vailakis (2003), we also introduce a borrowing constraint: we rule out the possibility of negative capital (of debt). Through the credit constraint, a positive capital works as collateral to reduce the amount of balances needed to finance the current consumption. Thus markets are incomplete and the collateral weakens the cash-in-advance.

We consider an endogenous growth model with a Romer-type (1986) learning-by-doing externality leading to constant returns to scale in capital accumulation. Endogenous growth rates are suitable to capture the effects of financial frictions (borrowing constraints) on the emergence of growth cycles (endogenous fluctuations of the growth rates). Business-cycle fluctuations are here represented as deterministic cycles arising out of bifurcations, and self-fulfilling prophecies.³

Under heterogeneous discounting, the population splits into two classes: patient capitalists and impatient workers.⁴ There is room for two regimes: the one where the capitalist holds capital and no balances, the other where money and capital enter her portfolio.

In the first, the credit constraint is not binding and the liquidity constraint does not affect the patient agents' capital accumulation. The economy jumps on the BGP. This conclusion goes along the regime with agents below their borrowing limits in Ferraris and Watanabe (2011). In this case, they show that fluctuations never occur in capital.

Alternatively, the credit constraint of patient agents binds and equilibrium transitions take place: endogenous fluctuations (two-period cycles and indeterminacy) may arise around the BGP. A similar conclusion is reached by Ferraris and Watanabe (2011) when agents are at their borrowing limits and fluctuations in capital occur.⁵ Eventually, we prove that

¹ Barbar and Bosi (2010) consider a similar model but with homogeneous agents.

² See also (Fostel and Geanakoplos, 2008) and (Geanakoplos and Zame, 2007), where the existence of collateralized assets affects market prices and allocations and may generate fluctuations.

³ See also Matsuyama (1999) and (2001) for the emergence of growth cycles from the interplay between investment and innovation.

⁴ Woodford (1986) also studies an economy with patient capitalists and impatient workers financially constrained. Even if these agents are infinite-lived, the reduced forms of his model look like an overlapping-generations model because of the nature of borrowing constraint. Our model is more standard and closer to Ramsey equilibrium models with cash-in-advance.

⁵ See also Matsuyama (2007) for the existence of credit cycles in a model with credit market imperfections and endogenous changes in investment technologies.

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