



ELSEVIER

Nonlinear Analysis: Real World Applications 5 (2004) 277–308

**Nonlinear
Analysis**

Real World Applications

www.elsevier.com/locate/na

Stability analysis of the Kaldor model with time delays: monetary policy and government budget constraint

Yasuhiro Takeuchi^{*,1}, Tatsuya Yamamura

*Department of Systems Engineering, Faculty of Engineering,
Shizuoka University, Hamamatsu 432-8561, Japan*

Received 23 August 2002; accepted 10 June 2003

Abstract

We analyze the model with monetary policy based on the Kaldor's business cycle theory. We introduce the government sector, which conducts the fiscal policy and monetary policy to stabilize the economy. The execution of such a policy needs legislation, and generally, the legislative process is time consuming. We investigate in this paper how the fiscal policy with a time delay affects stability of the economy.

We assume that the monetary policy is conducted as a countermeasure of the fiscal deficit by the government, and we consider two extreme cases, namely money finance and bond finance case. In each case, when no time delay exists for the fiscal policy, Keynesian fiscal policy is the preferred method for preventing the economic fluctuations. However, it is not so simple when the time delay exists in the fiscal policy. There exists the policy, which stabilizes the economy under any time delay in the money finance case. On the other hand, in the bond finance case, such a policy does not exist and as the time delay increases the economy becomes unstable. However in both cases, contrary to the expectations of the government, the stronger the fiscal policy, the more unstable the economy becomes for the short time delay.

© 2003 Elsevier Ltd. All rights reserved.

1. Introduction

Goodwin was probably the first economist to realize the importance of the nonlinear mechanism of the economy and to introduce nonlinear differential equations into

* Corresponding author. Tel.: +81-53-478-1200; fax: +81-53-478-1200.

E-mail address: takeuhi@sys.eng.shizuoka.ac.jp (Y. Takeuchi).

¹ The research was partly supported by the Ministry, Science and Culture in Japan, under Grand-in-Aid for Scientific Research(A) 13304006.

economics. Goodwin [4], based on the Marxian view, built a growth cycle model which generates closed cycles caused by the class warfare between capitalists and workers. His model is based on the Lotka–Volterra equations well known in mathematical biology [5,7,8]. Goodwin assumed the following situation: *all wages were consumed, further all profits were saved and invested*. This assumption is called Say’s law in economics, which means that the goods market equilibrium always holds and the effective demand problem does not appear [3]. Such an assumption is suitable for the analysis of classical capitalist economies, where there is no shortage of effective demand. However, we must dismiss this assumption if we consider about the business cycle theory in modern capitalist economies. That is to say, we need to consider the situation where the discrepancy between demand and supply exists in the goods market.

We introduce the Kaldor’s business cycle theory [6]. His model does not assume the balance in the goods market. For the simplification, we disregard the government expenditure and trade. Then the real output is equal to the national income (Y), and the demand is composed of only consumption (C) and investment (I). In this case, an excess demand Y_D is given by $Y_D = (C + I) - Y = I - (Y - C) = I - S$, where S is the saving, and Kaldor assumed that $\Delta Y \geq 0 \Leftrightarrow Y_D \geq 0$. The assumption shows the mechanism of the Keynesian quantity adjustment. Note that in the Kaldor model, flexible price adjustment mechanism is not considered. Furthermore, we can obtain from the above assumption that $\Delta Y \geq 0 \Leftrightarrow I \geq S$. Hence, the investment (not the saving) is important in order to increase the national income by the government.

Next, we describe a Kaldor’s investment function I . Let us express the real profit as P and the capital stock as K . He assumed that the increase of the real profit stimulates the investment volition of the investor, on the other hand, investment is controlled by the accumulation of capital. Therefore,

$$I = f(P, K); \quad \frac{\partial I}{\partial P} > 0, \quad \frac{\partial I}{\partial K} < 0.$$

Since we can consider P is increasing with respect to national income, we have

$$I = F(Y, K); \quad \frac{\partial I}{\partial Y} > 0, \quad \frac{\partial I}{\partial K} < 0.$$

Following Wolfstetter [9], we introduce the government sector which responds to the condition of the economy. If the economy is in prosperity (the national income increases) then the government decreases the expenditure, on the other hand, if there exist indications that the economy is in recession then the expenditure is increased by the government. Further, it is also necessary for the government to stimulate consumption and investment by the monetary ease. Hence, in the extended Kaldor model, the government will be able to conduct monetary policy which affects stability of the economy. In this paper, the economy is called stable if it is less fluctuating.

However, the effect of the stabilization policy by the government depends on the length of the policy lag, which is divided into recognition, decision, action lags. Suppose the situation where there exist indications that the economy is in recession. Some time will elapse before the policy makers recognize a recession (recognition lag). Then they intend an expansionary policy. The execution of such a policy needs legislation, and generally, the legislative process is time consuming (decision lag). Furthermore,

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات