

Nonlinear analysis of the defense-growth nexus: the case of France

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Evaluating the effects of defense spending on growth is a difficult task but has been widely debated. However, the case of French has not received an important treatment in the literature. This seems quite surprising given the importance of the defense sector in the French economy. The aim of this article is to provide new evidence for France with an original method.

We face three constraints for our modelling choice. First, given the multiplicity of channels by which defense affects growth, an atheoretical framework is suitable. Second, according to Smith (2009), the effects of military expenditure are likely to be too small to be observable. So he recommends to compare defense with non-defense spending. Finally, nonlinear model is a promising way of research.

Military expenditure is likely to exhibit nonlinear pattern in the growth determination. Several arguments are considered. It has been argued that public spending affects economic activity with a non-monotonic fashion (see Barro (1991) for a theoretical argument). According to Deger, from different stages of development, the impact of defense is asymmetric. Furthermore, the diversity of results from past literature is potentially linked with nonlinear structure: in the case of one same country and with the same model, different authors obtained different results. Here, the nonlinearity is due to structural changes. Given the implications of each argument, the choice of the transition variable is crucial.

The three variables (growth, military and non-military spending) model is estimated from 1960 to 2008. We use Logistic Smooth Transition Regression (LSTR). The results are as following:

1. The transition variable is the one lagged growth. This choice gives support to the Deger's argument: the effect of public spending, and defense spending in particular, is conditionnal

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to the economic activity.

2. A three regimes model is estimated. There is a low growth regime (cases of recession and below 1.4%), an intermediate growth regime (between 1.4% and 3.1%) and a high growth regime (above 3.1%).
3. Both extreme regimes exhibit the same structure of parameters. Non-defense spending exerts a positive impact whereas defense spending has no effect on growth.
4. The intermediate growth regime has a different pattern of parameters, compared with the extreme regimes. Military expenditure displays a positive consequence and non-military expenditure a negative one. Our results also reveal that the magnitude of the latter is higher (in absolute value) than that of the former.
5. The nonlinear regression appears to be superior in terms of regression quality compared to the linear model.

Some indications are expected from our analysis. A trade-off appears between military and non-military spending, depending on the economic activity. It is clear that non-defense expenditure is a better tool in order to stimulate the economy when we face recession, but for intermediate growth performance, defense expenditure outperforms the impact of its non-military counterpart.