

Shocks to Monetary Policy Uncertainty Dynamic Effects

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Introduction

The purpose of this study is to determine whether or not the impact of monetary policy uncertainty on the U.S. economy has altered over time. On U.S. data from 1985Q1 to 2022Q3, we estimate a Time-Varying Parameter Vector Autoregressive model and find that uncertainty shocks have a greater negative impact on output during the COVID-19 recession than at other times. However, during the Asian crisis of the late the IT bubble of the and the Great Recession, financial market variables like stock prices and dividends responded more strongly to uncertainty shocks. Then, we create a monetary policy-uncertain Dynamic Stochastic General Equilibrium model. We carry out a number of counterfactual exercises using the calibrated model to show that, in accordance with the empirical evidence, the effects of uncertainty shocks are influenced by the state of the economy. New insights into the time-varying nature of the impact of economic uncertainty are provided by these findings. Traditionally, underwater acoustic modems and positioning systems were developed for the military and Oil & Gas industries, which require deployments in deep water and extremely reliable systems.

Description

These industries prioritized high-power, expensive systems, leaving the use of low-cost devices to academic research. Conversely, the requirement for low-cost and low-power acoustic modems and positioning systems, which are gaining momentum to date, was prompted by recent developments of low-cost unmanned vehicles, such as remotely operated vehicles (ROVs) and autonomous underwater vehicles (AUVs), which are suitable for shallow water coastal missions. Additionally, the requirement for the deployment of sensors networks to measure water quality and study the effect of climate change in coastal areas prompted these developments. A wide range of applications can be made possible with the use of these gadgets, most of which are based on low-cost AUV swarm formations in which an acoustic link between the vehicles is needed to coordinate the mission, carry out the manoeuvres, and keep the formation together at all times. In addition, by substituting wired systems, they can reduce deployment costs for environmental wireless sensors. Due to the reduction in costs, underwater positioning systems, which are typically utilized in large-scale operations, can finally be applied to small-scale applications, albeit at the expense of a decreased transmission range and positioning precision. While this performance decrease is a significant drawback in open-sea applications, it is not a problem in deployments in rivers, lagoons, ports, and lakes due to the extremely shallow water and the presence of numerous obstacles, which would deteriorate the acoustic signal and prevent long-range transmissions even with costly and sophisticated acoustic devices. In this paper, we look at recent developments in low-cost and low-power acoustic

communication and positioning systems. We look at both university prototypes and new commercial devices that are currently on the market [1-3].

We talk about the benefits and drawbacks of each, as well as potential new applications that these systems could make possible. We decided to focus the paper on acoustic modems and positioning systems, which proved to be the most mature devices currently available, after providing a brief overview of the various communication and positioning systems based on electromagnetic, optical, and acoustic waves. Even though legacy acoustic modems like USBL, SBL, and LBL can provide precise positioning and communication over very long distances, their price and power consumption make them unsuitable for use in civil settings; in fact, the military and the oil and gas industries use them the most. On the other hand, despite having a lower bitrate, transmission range, and precision, low-cost acoustic devices can support a number of civil applications, including diver-to-diver communication, data retrieval from environmental sensors, and micro AUV swarms. Despite the fact that universities were the primary developers of these low-cost devices in the past, the recent development of low-cost AUVs and ROVs necessitated the availability of these devices on the market. Numerous new, low-cost underwater modems have been developed in recent years. On the other hand, there are still only a few low-cost localization systems. New systems are required, for example to make it possible for micro AUVs to drive themselves [4,5].

Conclusion

Additionally, the lack of a standard for low-cost underwater acoustic devices, as well as the difficulty of deployment caused by the absence of low-cost buoys and bottom nodes equipped with batteries that are simple to deploy and maintain, prevent modems built by various manufacturers from interoperating with one another, both of which limit their use in the mainstream. Therefore, in order for underwater sensor networks to become widespread, businesses ought to concentrate their efforts on the production of electronic equipment-carrying floaters that are inexpensive, simple to operate, and readily available off the shelf. In addition, they ought to advocate for making the waveform accessible to everyone. On the other hand, universities and researchers ought to provide the community with straightforward and in-depth how-to guides for their in-house developments, discuss and agree on a common modulation and coding scheme to enable interoperability between their prototypes, and disseminate their activities not only through scientific journals. Additionally, they ought to organize training events such as tutorials and summer and winter schools where they can teach how to develop a low-cost, simple software-defined modem. These events should also provide all participants.

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