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A Survey-based Shadow Rate and Unconventional Monetary Policy Effects

Hibiki Ichiue (Bank of Japan) and Yoichi Ueno (Bank of Japan)

This paper proposes a new approach to estimating shadow interest rate using macroeconomic forecasts, and uses it to evaluate the Federal Reserve's unconventional monetary policy (UMP). The authors say that the monetary policy stance may be more accommodative than suggested by the interest rate. They use shadow rate instead of short term rate.

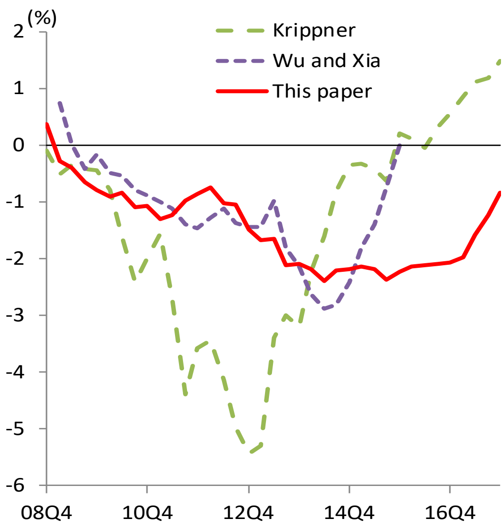
This study develops a novel estimate of the shadow rate and uses it to examine the effect of unconventional monetary policy on economic activity. A key feature of the authors' shadow rate estimate is that it incorporates survey forecasts of macroeconomic variables.

The study estimates the unobservable current shadow rate backward from observable survey forecasts. Intuitively, if a more accommodative monetary policy results in higher economic growth and inflation with a lag, then better survey forecasts imply a lower shadow rate, all else being equal.

Significantly, the authors' estimate has a number of advantages over existing estimates. Their estimate of the shadow rate can differ from the short rate even when the short rate is not constrained at the zero lower bound. Also the estimate does not impose arbitrary linear or nonlinear relationship between macroeconomic variables and longer-term interest rates. At the same time, the estimate can capture the stance of monetary policy that cannot be fully captured by longer-term yields or other monetary and financial variables.

The authors say that their estimate of the U.S. shadow rate was highly and negatively correlated with the Federal Reserve's asset holdings under the Large-scale Asset Purchase program, in particular its holdings of mortgage-backed securities (MBS). A 1 percent of GDP increase in the MBS holdings was associated with a more than 0.2 percentage-point decline in the shadow rate.

The shadow rate was negative even after the Federal Reserve started to raise the short rate in December 2015, thus suggesting that the balance sheet policy made monetary conditions more accommodative than suggested by the short rate.



Through a structural vector auto regression (VAR) analysis, the authors found that the Federal Reserve's UMP had a positive impact on GDP growth and inflation. The impact of the UMP on the year-on-year growth rate and inflation peaked at 0.4 and 0.5 percentage points, respectively.

However, through their counterfactual simulation the authors show that the Federal Reserve's policy stance was less accommodative than justified by the economic collapse in 2008-09, although it was more accommodative thereafter.

The authors say that one possible reason behind this result is that the Federal Reserve's aggressive UMP had only limited impact on macroeconomic variables during the economic collapse, which may have impaired the transmission mechanisms of monetary policy to a large extent.

Looking ahead the authors say that their method can be applied to other countries as it is applicable to any country in which macroeconomic forecasts are available and a VAR describes the economy well. Furthermore, their approach of informing the shadow rate estimation with survey forecasts can be adapted to the estimation of other unobservable variable, such as the natural rate of interest.

Workplace Flexibility and Entrepreneurship

Sumit Agarwal (Georgetown University & ABFER), Tien Foo Sing (National University of Singapore), Chang Cheng Song (National University of Singapore) and Jian Zhang (Hong Kong Baptist University)

Entrepreneurship has long been recognised as a key mechanism for enhancing economic development. Designing policies to remove barriers to entry have long intrigued both policy makers and academics.

The authors study a large-scale reform in Singapore that allows the possibility of business creation at one's residential property and analyse whether the option of home-based entrepreneurship spurs entrepreneurial activities. Before November 2001, it was not possible to register a business under one's residential address. After November 2001, a pilot scheme allowed small-scale businesses to operate from homes located in selected mixed zone areas. In June 2003, the Home Office Scheme allowed for business creation at all residential units.

The authors use data primarily from two sources in this study. The basic data is obtained from the Accounting and Corporate Regulatory Authority (ACRA), which contains the universe of firm that are created from 1990 to 2015. The second data source is a unique personal database containing demographic information of individuals in Singapore. The scheme also stipulated a negative list of industry type that are prohibited from home-based operation (employment agencies, restaurants, retail shops) which constitutes the control group. In contrast, the treatment group contains industries that are allowed under the scheme.

Figure 1 Business Creation: Treated vs Control

The figure plots the 12-month moving average of the number of business created in the treated and control industries from January 2000 to March 2005 (1999 does not appear because of the 12-month average). The vertical lines correspond to the reform period (1st stage, December 2001 to June 2003; 2nd stage, July 2003-)

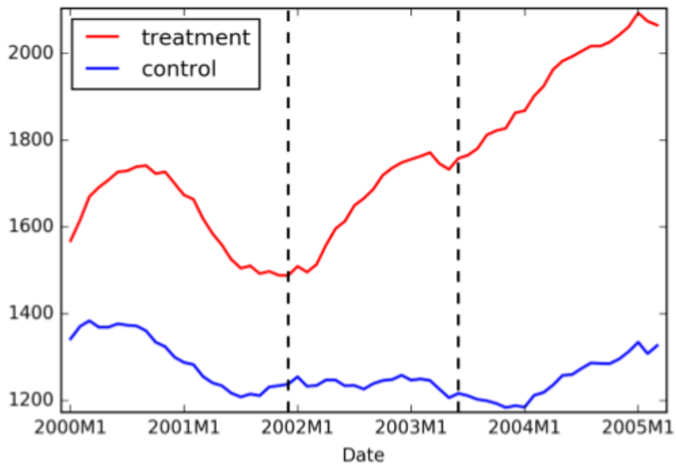


Figure 1 compares the response of the two groups pre- and post-policy, while there are no significant differences in entrepreneurial activities between the treatment and control groups during pre-policy period, the growth rate of newly created firms in the treated industries is significantly higher at both post-policy stages. Figure 2 shows that post-policy, the number of new firms created increases by 23 percentage.

Evidence shows that the effect is more pronounced for low-income individuals, for whom access to capital is most likely to be the foremost barrier to entrepreneurship. Using housing type to proxy for financial constraint, they find that the treatment industries attract more entrepreneurs living in subsidised public housing (Poor Community). These results indicate that reducing entry cost is important to encourage firm creation.

The authors explore other possible explanations for the increase in new firm creation and find no evidence that the treatment industries attract more married entrepreneurs who benefit more from the engagement in joint market and household production. They also do not find evidence that more would-be entrepreneurs enter the market even if the home office environment allows them to "save face" from possible business failure.

The authors also look at the quality of the start-ups. Additional new firms in response to the policy choose industries with higher productivity and lower risk and have a higher

Figure 2 Home Office Scheme and Business Creation

The table investigates the impact of the home-office scheme on firm creation. The sample includes 81 industries, January 1999 - March 2005, monthly. The sample period is selected to avoid the confounding effect of 97-98 Asian financial crisis and Singapore's Limited Liability Partnership Act of 2005 implemented in April 2005. *Pre* is a dummy equal to 1 for the observations during the period from 200001-20011, otherwise 0. *Post* is a dummy equal to 1 for the observations after the reform (200112-200503), otherwise 0. *Post_1_Stage* is a dummy equal to 1 for the observations in first stage of reform period (200112-200306), otherwise 0. *Post_2_Stage* is a dummy equal to 1 for the observations in second stage of reform period (200307-200503), otherwise 0. *Treated* is a dummy equal to 1 if the industry does not belong to the forbidden industry in the Home Office Scheme. *Industry productivity* is the change in value added per work in each industry. *GDP Growth* is the annual GDP growth in Singapore. *, **, *** denotes significance at the 10%,

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	Log (1+number of new firms created in an industry at a month)						
Treated*Pre	-0.018						
	(-0.35)						
Treated*Post	0.230***	0.236***	0.237***	0.220***			
	(2.76)	(3.21)	(3.26)	(3.04)			
Treated*Post_1_Stage					0.117**	0.117**	0.118**
					(1.96)	(2.01)	(2.05)
Treated*Post_2_Stage					0.344***	0.344***	0.343***
					(3.69)	(3.72)	(3.45)
Constant	2.203***	2.203***	2.204***	1.148***	2.203***	2.204***	2.202***
	(44.35)	(44.40)	(43.43)	(3.51)	(44.40)	(43.33)	(40.99)
Control for industry productivity	No	No	Yes	Yes	No	Yes	Yes
Treated*GDP Growth	No	No	No	Yes	No	No	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,075	6,075	6,075	6,075	6,075	6,075	6,075
R-squared	0.94	0.94	0.94	0.94	0.94	0.94	0.94

survival rate. Their entrepreneurs are also more likely to set up a second (and usually larger) business with similar survival rate. Moreover, under the new policy, more failed entrepreneurs are more likely to set up a new business again in the future.

These results show that the workplace flexibility accorded by the Home Office Scheme effectively spurs entrepreneurial activities and attracts more entry into self-employment without significantly lowering the average quality of the pool.

The study is among the first to document that designing effective policies to remove barriers such as reducing the entry costs leads can lead to a significant increase in the level of new firm creation. such as revenue, opening and closing of subsidiaries, and M&A activity. Also, the study adds the cost of doing business to the list of drivers of foreign activity and international cross-border flows.

The study also examines the spillovers of the U.K. Bribery Act on competitors of U.K. firms. It finds that competitors of U.K. firms may benefit through two channels. Some unregulated competitors' expected payoff from offering bribes may increase as regulated firms may decide to quit the corrupt regions thus resulting in reduced competition. Also, companies subject to anti-bribery regulations in their home country already but nevertheless competing in corrupt regions may benefit because the U.K. Bribery Act actually levels the field.

To shed more light on the drivers behind the drop in U.K. firms' value due to the U.K. Bribery Act, the study also examines the firms' response to the new law in terms of subsidiary locations and revenues, as well as M&A and joint venture activity.

Global Market Inefficiencies

Söhnke M. Bartram (University of Warwick) and Mark Grinblatt (University of California)

For their study of market efficiency, Professors Söhnke M. Bartram and Mark Grinblatt use international accounting data that are readily available to investors. They employ point-in-time accounting data to estimate monthly out-of-sample fair values of over 25,000 stocks from 36 countries with a novel methodology. The authors show that the stock price deviations from their accounting-implied fair value predicts their future returns.

A simple trading strategy based on deviations from fair value yields statistically and economically significant risk-adjusted returns in most regions, especially the Asia Pacific region.

These returns are significantly larger in emerging than developed markets, suggesting that emerging markets are less efficient at incorporating basic, widely available fundamental information. Profits are also large in Asia Pacific's developed markets, notably Japan. The strategy's performance is modestly lower when value weighted, but is profitable within groups of stocks that share similar amounts of 20 "anomaly characteristics" known to predict returns. Thus, mispricing in international equity markets is not tied to known anomalies or sources of risk, but may be tied to differences in market frictions across countries.

The authors say that buy-and-hold strategies that reduce transaction costs, as well as alternative fair value specifications, risk adjustment techniques, and estimation approaches do not eliminate the strategy's profitability. However, reduced turnover strategies tend to modestly lower profitability measured before netting out trading costs.

One of the more interesting findings of this study is that trading costs predict pre-transaction cost returns and that, in a hypothetical country with zero trading costs, the mispricing signal does not lead to a positive alpha. Differences in the signal's monthly alphas of 40-70 basis points between emerging and developed markets contrast with findings of prior research about the relative efficiency of these two market types. Globally, pre-transaction-cost alphas, which are unrelated to known anomalies, are positively related to trading costs, but exceed country-specific institutional trading costs.

Overall, the paper's portrait of market efficiency offers a middle ground, supporting both the view that prices reflect fundamentals and that sentiment drives price movements. In this portrait, deviations from fair value are within bounds set by frictions. As the frictions vary, so do the bounds. If sentiment moves prices, but only within bounds set by the deployment of arbitrage capital, then it is important to understand what drives the deployment of arbitrage capital.

In this view, asset pricing should be more centered on the objective functions of the arbitrageurs. For example, the average covariance between stock pairs within a small country has little bearing on asset prices for worldwide diversified portfolios. For portfolios that concentrate in a country, high average covariance is generally unattractive to a long-only portfolio manager as it tends to increase the return variance of the portfolio. However, it may have a very different effect on the risk of long-short strategies, other things being equal.

Thus, global equity markets are inefficient, but are relatively less efficient in counties with quantifiable market frictions, particularly trading costs, that deter arbitrageurs.

Barriers to Entry and Regional Economic Growth in China

Loren Brandt (University of Toronto), Gueorgui Kambourov (University of Toronto) and Kjetil Storesletten (University of Oslo)

This paper studies regional economic growth in China and analyzes the factors behind the initial dispersion and subsequent strong convergence in wages, total factor productivity (TFP), and capital per worker. The non-state manufacturing sector has been the engine of China's economic transformation. The authors say that up through the mid-1990s, the sector showed large regional differences. Subsequently they observe rapid convergence in terms of new firm start-up rates, productivity and wages.

To analyze the drivers of this behaviour, the authors of this paper construct a model that incorporates location-specific capital wedges, output wedges, and a novel entry barrier. Using Chinese Industry Census data for 1995, 2004, and 2008, the study estimates these wedges and examines their role in explaining differences in performance across prefectures and over time.

The study finds that entry barriers turn out to be the salient friction for explaining performance differences. The authors investigate the empirical covariates of these entry barriers and find that barriers are causally related to the size of the state sector. Thus the downsizing of the state sector after 1997 may be important in explaining the rapid manufacturing growth over the 1995-2008 period.

The authors say that to their knowledge their study is the first to quantify distortions driving regional growth in China and is the first paper to address measurement error in firm-level data in the presence of time-varying distortions.

Making a number of contributions, this paper provides an analytical framework that can be used as an accounting device to identify distortions that inhibit or stimulate growth in a development context. Second, the authors use this framework to provide new insights for understanding growth dynamics in China. They identify new firm behaviour and the removal of barriers to entry as the driver of regional wage and TFP growth.

This paper documents an important set of new empirical facts on regional economic development, emphasizing the strong convergence in wages, TFP, and capital per worker across regions after the mid-1990s. Further, the authors study the empirical determinants of the prefecture-specific barriers to entry. They document a novel and important channel: the presence of state-owned firms cause larger entry barriers for non-state firms.

This finding points to an important side effect of the reforms of the state-owned sector of the late 1990s. As SOEs were scaled back the entry barriers for private firms came down. This in turn paved the way for the subsequent rapid economic growth.

In their study the authors examine and rule out a number of alternative explanations for the observed behaviour, including differences across prefectures in the kinds of technology non-state sector firms can access; differences in the quality of entrants, and finally, differences in the fixed cost of doing business.

In the context of the recent marked slowdown in economic growth in China, the authors' analysis provides a potential mechanism for the recent slowdown in economic growth, namely that the resurgence in the state sector following the Global Financial Crisis may have contributed to larger entry barriers and, hence, lower non-state sector growth.

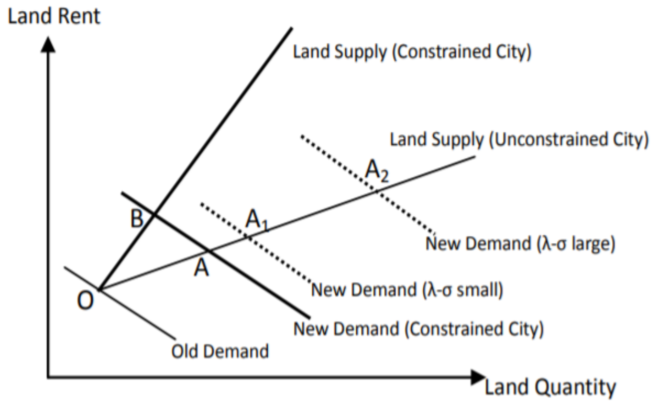
Urban Structure, Land Prices and Volatility

Sheridan Titman (University of Texas, Austin) and Guozhong Zhu (University of Alberta)

According to a research report by Savills, a UK real estate consultant, the total value of all real estate in the world is about US $217 trillion, which is about 2.7 times the world's GDP. Real estate is clearly the most important capital asset in the world economy, but as illustrated by the recent financial crisis, our understanding of the determinants of real estate valuation, and in particular, the volatility of real estate prices, is still incomplete.

This paper examines the relationship between urban characteristics and rent volatility within the context of the seminal monocentric city models. In this class of models, all commercial activity is conducted in an exogenous central business district (CBD) at the centre of the city and workers commute to work from the outer rings of the city. The productivity of the firms in the commercial sector, along with the cost of transporting workers from the outskirts to the CBD, determines rents, wages and the size of the city.

Figure 2: City Constraints and Land Rent Elasticity



Note: The responsiveness of land rent to a positive productivity shock depends on both the supply elasticity of land and the strength of agglomeration effect.

Our extension of these models explicitly considers agglomeration externalities that make firms more productive in larger cities, and thus amplify exogenous productivity shocks that attract additional workers to the city. We also consider alternative physical characteristics (or zoning restrictions) that effectively create land supply constraints, and as we show, dampen the effect of productivity shocks on population growth. We also explore the implications of transportation costs, which also effectively limit urban growth.

After analytically exploring how the response of wages and rents to productivity shocks depends on urban characteristics, this static model is then extended to a dynamic model which looks at the evolution of land prices and rental rates in a monocentric city. The model explores the implications of urban configurations that may differ in terms of the flexibility of the city's borders and land use, i.e., zoning and the presence of undevelopable land, as well as differences in transit technology, i.e., cars versus rail. The model also considers the effect of production technologies that have different land use intensities and agglomeration externalities.

We used various parameters to conduct simulations that allow us to gauge how quickly the model's endogenous variables, e.g., population, rents, and wages, respond to exogenous shocks, and to also measure the relation between the volatility of these parameters and various city characteristics.

By simulating shocks to the exogenous element of a city's productivity, we are able to explore how the structure of the city and its industrial base affects the volatility of its population and land rents. The dynamic model is solved numerically, which allows us to quantitatively study and generates rental rate volatilities, serial correlations, and rent to value ratios that can be compared to actual data on commercial rents and values from major U.S. cities (using data from CBRE, a large commercial broker and Real Capital Analytics, a real estate data vendor).

Our analysis suggests that volatility is amplified when production exhibits strong agglomeration effects and is dampened when land use plays a larger role in the production function and when transit exhibits strong congestion effects. In some settings land supply constraints make rental rates more volatile. However, we also identify settings under which increases in land supply constraints dampen volatility.

How does Tax Avoidance affect Corporate Transparency?

Congcong Li (Singapore Management University), Mark (Shuai) Ma (American University), Thomas C. Omer (University of Nebraska – Lincoln) and Kunpeng Sun (Tsinghua University)

As U.S. firms have significantly increased tax avoidance during the last three decades, this increased avoidance has attracted attention from politicians, news media, regulators, and scholars. In this paper, the authors point out that while earlier research has focused on the determinants of tax avoidance, the consequences of tax avoidance are relatively under-explored. More recent studies have examined the implications of tax avoidance for corporate financial reporting and transparency but find mixed evidence.

The new finding of this study is that the effect of tax avoidance on transparency depends on the level and potential aggressiveness of the tax avoidance behavior. Specifically, less aggressive tax avoidance is usually not sophisticated and reduces cash taxes paid to the taxing authorities. The improved cash flows motivate firms to increase corporate transparency. However, more aggressive tax avoidance is more complicated and could lead to more managerial rent extractions, which mitigates the positive effect of cash tax savings and results in more obfuscation. Therefore, the positive effect of tax avoidance on transparency should dominate over the less aggressive end of the tax avoidance continuum, and the negative effect should dominate over the more aggressive end of the continuum.

This study predicts a non-linear association between tax avoidance and corporate transparency. Using eight alternative proxies for corporate transparency and three alternative measures of tax avoidance, the authors find evidence consistent with their expectation. Specifically, using a large sample of U.S. firms from 1995 to 2016, the authors find a significant non-linear effect of tax avoidance on transparency. Thus, when a firm's tax avoidance is low, an increase in tax avoidance improves transparency; however, when a firm's tax avoidance is high, an increase in tax avoidance decreases transparency. These results are robust in several additional tests.

This study makes several contributions. First, it contributes to a better understanding of the consequences of tax avoidance. Second, the study also contributes to the literature on the interaction of financial and tax reporting. The findings lend further support to the idea that tax-reporting behavior affects financial reporting. Third, this study contributes to the growing literature on agency costs of tax avoidance. What is unknown in the literature is that at what point managers reduce information available to investors and tax authorities because of their tax avoidance activities.

Importantly, this study is important for investors in understanding the implications of tax avoidance for analyzing the information risk. This study provides initial evidence of the point at which tax avoidance reduces corporate transparency and thus information available to investors.

Overall, the study supports the idea that tax avoidance has implications for analyzing corporate transparency. However, the direction of the transparency effect of tax avoidance on corporate transparency depends on the aggressiveness of firms' tax avoidance behavior.

About ABFER

The Asian Bureau of Finance and Economic Research is an institute founded by academics from Asia, North America, and Europe. The Bureau intends to create a virtual and independent network of high-quality academics akin to the NBER/CEPR, as well as conferences and workshops.

The purposes of the Bureau include:

- to promote Asia-Pacific oriented financial and economic research at local, regional and international levels;
- to connect globally prominent academic researchers, practitioners and public policy decision-makers on Asia-Pacific related financial and economic issues;
- to enhance the research capabilities and development of strong clusters of finance and economic research groups in academic institutions and other institutions in Singapore and Asia-Pacific.

This Digest summarizes selected papers presented in the ABFER 6th Annual Conference which was held in May 2018 at Shangri-La Hotel, Singapore. More information on the conference can be found here.

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