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Journal of International Money and Finance

journal homepage: www.elsevier.com/locate/jimf



Using extraneous information to analyze monetary policy in transition economies

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A B S T R A C T

JEL classification:

C32
C33
E52
F41

Keywords:

Transition economy
Monetary transmission mechanisms
Structural VAR
Mixed estimation

Empirical macroeconomics is plagued by small sample size and large idiosyncratic variation. This problem is especially severe in the case of the transition economies. We utilize a mixed-estimation method incorporating prior information from OECD country data to estimate the parameters of a reduced-form transition economy model. An exactly identified structural VAR model is constructed to analyze monetary policy in the transition economies. The OECD information increases the precision of the impulse response functions in the transition economies. The method provides a systematic way to analyze monetary policy in the transition economies where data availability is limited.

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1. Introduction

The nature of the monetary transmission mechanism in market economies is difficult to ascertain.¹ It is even more difficult to identify these mechanisms in transition economies.² During the planned-economy era and the early-transition period, a market-type economy (MTE) monetary transmission mechanism did not exist in the formerly centrally planned, now transition, economies because of the underdevelopment of financial institutions and markets. Nor could such a mechanism be measured, since the data generation and collection processes also did not exist. By the middle of the 1990s, institutions and financial markets had developed sufficiently for policymakers to begin employing

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¹ See, for example, Boivin and Giannoni (2002) and Ciccarelli and Rebucci (2002).

² See Wrobel and Pawlowska (2002), Golinelli and Rovelli (2005), and recently, Borys and Horvath (2007).

traditional MTE monetary policy tools, resulting in consistent and purposeful monetary policy.³ However, data availability still limits policy analysts' ability to do quantitative analysis.

When time series are short, economists rely on common theories and experience gleaned from economic history in other countries. Even in the Organization for Economic Co-operation and Development (OECD) countries, macroeconomists use common theories to do analysis across time and national borders. Typically, the structures of the models are similar, but the particular empirical estimates vary. The variation may be due to systematic differences in institutions or policy. It may also reflect the presence of idiosyncratic shocks that can dominate econometric estimates in data sets. Forecasters typically find that in-sample model-selection procedures are of little use in choosing models that will do well in out-of-sample forecasting experiments. *Stock and Watson (2003)* attribute this result to large idiosyncratic shocks.

In a similar vein, *Devereux (2003)* argues that the structures of transition economies (TEs) are similar to the MTEs, but that the shock processes are different. This implies that the typical MTE macroeconomic model and even MTE data may be employed to improve the precision of estimated TE models. Using a small structural vector autoregression (SVAR) *Kim (2002)* compares the reaction function and effects of monetary policy across West European countries. He found similarities in the effects of policy across Denmark, France, Germany and Italy. We suggest that using data from OECD countries can improve the confidence we have in empirical policy analysis for some transition economies. In particular we suggest using information from the MTEs in those economies where basic reforms have been enacted, but in which there is little history from which to estimate econometric relationships. By basic reforms we mean only that (1) disciplined monetary, fiscal and regulatory institutions have operated effectively for some time; (2) prices and output are determined by market forces in most sectors; and (3) a standardized system of national income and product accounts have been implemented and corresponding economic data are reported. If the economy is thought to be operating like a market economy, but there is only a short history of macroeconomic time-series data, our approach can reduce the sampling error associated with small data sets. The Czech Republic, Hungary and Poland fit these criteria – the above reforms have taken place, but there is insufficient data to estimate models with high precision. Our approach should prove useful in forecasting macroeconomic aggregates and analyzing potential effects of monetary policies.⁴

In this paper we evaluate the impact of monetary policy in these three transition economies using a structural vector autoregressive (SVAR) model that has been widely used to analyze policy in developed market economies. The monetary policy shocks are identified in a Wold recursive ordering as in *Eichenbaum and Evans (1995)* and *Christiano et al. (1999, 2005)*. This framework, presented in Section 2, requires more data than is typically available in the TEs. Therefore, we explore the use of OECD country data as extraneous information to improve the precision of our estimates for the three TEs. Section 3 explains the panel SVAR model and the mixed-estimation procedures that are used to analyze the effects of a contractionary monetary policy shock. As a preliminary check on the robustness of our method, we compare the impulse responses to a contractionary monetary policy shock estimated using the 15-country OECD MTE panel with those from a model estimated using a three-country TE panel. The dynamic patterns evident in the two models are quite similar. In Section 4 we examine the impulse response functions and variance decompositions from the three-TE country models estimated individually and with the extraneous information taken from the OECD MTE panel. The individual country model with extraneous information from the MTE model provides more precise estimates regarding the monetary policy shock than the models with only that single country data. Although the results are conditioned by the MTE data and look similar, differences remain. Section 5 offers a summary of the analysis and a discussion of policy implications.

³ See *Jonas and Mishkin (2007)* for a discussion of alternative policy regimes and the evolution of monetary policy toward inflation targeting in transition economies, the Czech Republic, Hungary and Poland in particular.

⁴ See *Gavin and Theodorou (2004)* for evidence that the common model often predicts individual country macro-variables better than models estimated using only the own-country data. We extend that exercise to forecast the transition economies and report the results in a forecasting appendix that is available from the authors.

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