

## INTERNATIONAL MONETARY FUND

Joint Vienna Institute / IMF Institute for Capacity Development

Course on Macro-econometric Forecasting and Analysis (JV17.11)

Vienna, Austria

April 17 – 28, 2017

PROGRAM<sup>1</sup>**Monday, April 17**

9:00 a.m. – 9:15 a.m.		<b>Administrative Briefing</b> <i>Ms. Marina Scherbakova</i> , Program Officer, JVI
9:15 a.m. – 9:30 a.m.		<b>Opening Session</b> <i>Mr. Thomas Richardson</i> , Director, JVI; and <i>Mr. Charis Christofides</i> , Senior Economist, European and Middle Eastern (EM) Division, IMF Institute for Capacity Development (ICD)
9:30 a.m. – 10:30 a.m.		<b>Initial Quiz</b>
10:30 a.m. – 12:00 p.m.	L-0	<b>Introductory Lecture: Overview of the Macroeconomic Forecasting course</b> <i>Mr. Charis Christofides</i> <ul style="list-style-type: none"> <li>• A short introduction to the design of the course, its main elements, and objectives</li> <li>• Structure of the course, role of participants and counselors</li> <li>• Philosophy of forecasting, caveats, and related issues</li> </ul>
12:00 p.m. – 12:30 p.m.		<b>Group photo</b>
	<b>Unit 1</b>	<b>Structural VARs and their application I: short-run restrictions</b> <i>Mr. Mikhail Pranovich</i> , Economist, EM Division, ICD
2:00 p.m. – 3:30 p.m.	L-1	<ul style="list-style-type: none"> <li>• Introduction to SVAR: identification problem</li> <li>• Choleski decomposition and short-run SVAR restrictions</li> </ul>
3:30 p.m. – 5:30 p.m.	W-1	<ul style="list-style-type: none"> <li>• Evaluating effect of monetary policy shocks in “Choleski-ordered” SVARs, SVARs with the “institutionally-implied” short-run restrictions</li> </ul>

<sup>1</sup> Coffee breaks are held from 10:30 a.m. – 11:00 a.m. and from 3:30 p.m. – 4:00 p.m.  
Lunch breaks are from 12:30 p.m. – 2:00 p.m. (Unless otherwise indicated).

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**Tuesday, April 18**


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	<b>Unit 2</b>	<b>Modeling of non-stationary variables, forecasting with VECMs</b> <i>Mr. Alexei Miksjuk, Junior Economist, JVI</i>
9:00 a.m. – 12:30 p.m.	L-2	<ul style="list-style-type: none"> <li>• Testing variables for integration</li> <li>• Testing for co-integration and estimating VECMs</li> </ul>
2:00 p.m. – 5:30 p.m.	W-2	<ul style="list-style-type: none"> <li>• Estimating long-run macroeconomic equilibrium relationships. Forecasting with VECMs</li> </ul>

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**Wednesday, April 19**


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	<b>Unit 3</b>	<b>Structural VARs and their application II: long-run and other restrictions</b> <i>Mr. Alexei Miksjuk</i>
9:00 a.m. – 10:30 a.m.	L-3	<ul style="list-style-type: none"> <li>• Identifying structural VARs using long-run restrictions</li> <li>• Other restrictions</li> </ul>
10:30 a.m. – 12:30 p.m.	W-3	<ul style="list-style-type: none"> <li>• An SVAR for evaluating effects of fiscal policy. Studying the effects of supply and demand shocks in an SVAR with long-run restrictions. Identification using sign restrictions.</li> </ul>
	<b>Unit 4</b>	<b>Conditional forecasting with VARs in small open economies</b> <i>Mr. Mikhail Pranovich</i>
2:00 p.m. – 3:30 p.m.	L-4	<ul style="list-style-type: none"> <li>• Conditional forecasting using VARs</li> <li>• Incorporating external forecasts and scenario analysis</li> </ul>
3:30 p.m. – 5:30 p.m.	W-4	

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**Thursday, April 20**


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	<b>Unit 5</b>	<b>State-Space Models and the Kalman Filter</b> <i>Mr. Charis Christofides</i>
9:00 a.m. – 12:30 p.m.	L-5	<ul style="list-style-type: none"> <li>• State-space representation</li> <li>• The Kalman filter</li> <li>• Maximum likelihood estimation and Kalman smoothing</li> </ul>
2:00 p.m. – 5:30 p.m.	W-5	<ul style="list-style-type: none"> <li>• Application of state-space models: estimating business condition index, forecasting the yield curve, estimating equilibrium interest rate</li> <li>• Output gap estimation (e.g., HP filter, multivariate filter)</li> </ul>

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*Friday, April 21*

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	<b>Unit 6</b>	<b>Bayesian Models and Bayesian VARs (BVARs)</b> <i>Mr. Mikhail Pranovich, Mr. Alexei Miksjuk (2<sup>nd</sup> part of W-6)</i>
9:00 a.m. – 12:30 p.m.	L-6	<ul style="list-style-type: none"> <li>• Introduction to Bayesian econometrics, estimation of linear regression models</li> <li>• Activity: exercise on Bayesian estimation of moments of normal distribution</li> <li>• Estimating BVARs with analytical Minnesota and DSGE-VAR priors</li> <li>• Review of empirical results on BVARs forecasting performance</li> </ul>
2:00 p.m. – 5:30 p.m.	W-6	<ul style="list-style-type: none"> <li>• Estimating BVARs with Minnesota, Normal-Wishart priors and DSGE-VAR priors. Forecasting macroeconomic variables with BVARs</li> </ul>

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*Monday, April 24*

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	<b>Unit 7</b>	<b>Factor Models and Factor-Augmented VARs (FAVARs)</b> <i>Mr. Massimiliano Marcellino, Professor, Bocconi University</i>
9:00 a.m. – 10:30 a.m.	L-7	<ul style="list-style-type: none"> <li>• Basics of factor models</li> <li>• Small and large scale; selection of number of factors</li> </ul>
10:30 a.m.– 12:30p.m.	W-7	<ul style="list-style-type: none"> <li>• Estimation, forecasting with FAVAR</li> </ul>
2:00 p.m. – 3:30 p.m.	L-8	<ul style="list-style-type: none"> <li>• Extensions</li> <li>• Unbalanced datasets; I(1) variables; nonlinearities</li> </ul>
3:30 p.m. – 5:30 p.m.	W-8	<ul style="list-style-type: none"> <li>• Estimating FAVARs on several macro-financial datasets (monthly industrial production; quarterly GDP growth; monthly inflation). Examples from both industrial and emerging economies.</li> </ul>

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*Tuesday, April 25*

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	<b>Unit 8</b>	<b>Mixed Frequency Models (MIDAS, UMIDAS, 3PRF)</b> <i>Mr. Massimiliano Marcellino</i>
9:00 a.m. – 10:30 a.m.	L-9	<ul style="list-style-type: none"> <li>• Introduction, bridge models</li> <li>• MIDAS – representation, estimation, forecasting</li> <li>• UMIDAS and extensions</li> </ul>
10:30 a.m.– 12:30p.m.	W-9	<ul style="list-style-type: none"> <li>• Forecasting quarterly GDP growth (advanced case, Poland, Jordan)</li> </ul>
2:00 p.m. – 3:30 p.m.	L-10	<ul style="list-style-type: none"> <li>• MIDAS – representation, estimation, forecasting</li> <li>• Extensions (factor models, 3PRF)</li> </ul>
3:30 p.m. – 5:30 p.m. (will end earlier)	W-10	<ul style="list-style-type: none"> <li>• Forecasting quarterly GDP growth (advanced case, Poland, Jordan)</li> </ul>

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*Wednesday, April 26*

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	<b>Unit 9</b>	<b>Forecast Combinations</b> <i>Mr. Charis Christofides</i>
9:00 a.m. – 10:30 a.m.	L-11	<ul style="list-style-type: none"><li>• Motivation for combining forecasts</li><li>• Implementation issues</li><li>• Methods to assign weights Volatility impact on first moment prediction</li></ul>
10:30 a.m. – 12:30 p.m.	W-11	<ul style="list-style-type: none"><li>• Application of combination techniques to forecasting of macroeconomic variables</li></ul>
	<b>Unit 10</b>	<b>Final Project: application of models for policy analysis and forecasting in selected countries</b> <i>All Counselors (Mr. Alexei Miksjuk to provide introduction)</i>
2:00 p.m. – 5:30 p.m.	O-1	<ul style="list-style-type: none"><li>• Projects: Participants will be provided (and encouraged to bring their own) datasets for a number of selected countries from the region and apply models taught in the course to forecast inflation or another key macro variable (single equation, factor, Kalman Filter, combination, etc.)</li></ul>

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*Thursday, April 27*

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9:00 a.m. – 5:30 p.m.	<b>Unit 10 (cont'd)</b>	<b>Final Project: application of models for policy analysis and forecasting in selected countries</b> <i>All Counselors</i>
	O-1	<ul style="list-style-type: none"><li>• Projects: Participants will be provided (and encouraged to bring their own) datasets for a number of selected countries from the region and apply models taught in the course to forecast inflation or another key macro variable (single equation, factor, Kalman Filter, combination, etc.)</li></ul>

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*Friday, April 28*

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9:30 a.m. – 11:30 a.m.	<b>Unit 10 (final)</b>	<b>Final Project: application of models for policy analysis and forecasting in selected countries</b> <i>All Counselors</i>
	O-2	<ul style="list-style-type: none"><li>• Project presentations: groups present and discuss results of their projects in a plenary session</li></ul>
11:30 a.m. – 1:00 p.m.		<b>Final Test and Course Evaluation</b>

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