

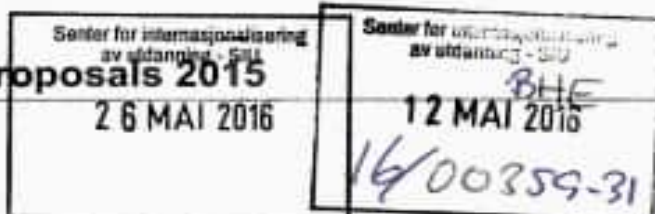
# Eurasia Programme - Call for proposals 2015

## Project document

### Project identification

Project number CPEA-2015/10119

Project title Extended Learning of Economics with Dynamic Modeling



## CONTRACT

### Special conditions

#### A. CONTRACTING PARTIES

This contract is entered into by and between;

The Norwegian Centre for International Cooperation in Education, with organisation number 986 339 523 (hereinafter referred to as "SIU"; and

University of Bergen, with organisation number 874 789 542

(hereinafter referred to as the "Institution in Norway" or "IIN")

#### B. CONTRACT DOCUMENTS AND RULES OF INTERPRETATION

The Contract consists of these Special Conditions, the General Conditions and the Project Document. If there is a conflict between provisions in the Contract, the Special Conditions shall prevail over the General Conditions, and the General Conditions over the Project Document.

#### C. FINANCIAL CONTRIBUTION FROM SIU

In pursuance of (a) the Norwegian Cooperation Programme in Higher Education with Eurasia (the «Programme»), established through "Avtale om forvaltning av tilskuddsmidler og samarbeid mellom Utenriksdepartementet og Senter for internasjonalisering av utdanning (SIU) i perioden 2015-2020" (the «Programme Document»), and (b) the approval of the Project made by the committee authorized to allocate funds under the Programme Document, SIU hereby undertakes – on the terms and conditions set out herein this Contract – to make the following financial contribution (the «Funds») to the Institution in Norway in respect of the Project:

**NOK** 6000000

The Funds will be paid to the Institution in Norway in accordance with the schedule set out in Article D.1.

#### D. PROGRAMME AND PROJECT SPECIFIC PROVISIONS

Notwithstanding anything to the contrary in this Contract, the following specific provisions shall apply:

##### D.1 Disbursement of the Funds

In the first year of the Project, SIU shall pay: (i) 80 per cent of the amount budgeted for the first year of the Project as soon as possible and latest within 45 days after receipt of a duly signed and dated copy of the Contract; and (ii) 20 per cent of the amount budgeted for the first year of the Project within 45 days after SIU's approval of the start-up report (to be delivered to SIU within the deadline set in Article D.2.). In subsequent years of the Project, SIU will within 1 March disburse 60 per cent of the amount budgeted for the relevant year in the last progress report approved by SIU. The balance of the amount budgeted will be revised by SIU on basis of the subsequent progress report delivered in the Project. The balance (as revised) will be transferred latest within 45 days of SIU's approval of the subsequent progress report. Unused funds from the previous year, if any, may be deducted from the balance unless approved carried forward to the next year's budget. SIU's decisions with regard to approval or otherwise of the annual/final project reports and accounts shall be final.

##### D.2 Reporting obligations

The Institution in Norway shall within 15 September 2016 provide SIU with a start-up report, including a short description of the progress of project activities and any anticipated obstacles going forward.

Thereafter, the Institution in Norway shall provide SIU with annual progress reports, including updated accounts, and a description of the progress of ongoing/planned project activities and any anticipated obstacles going forward. The annual progress reports shall be submitted to SIU within 1 March each year. Lastly, upon finalisation of the Project, the Institution in Norway shall without undue delay provide SIU with a final project report containing final accounts for the Project, and a description of the Project Results together with an assessment of the overall success of the Project. The Institution in Norway must, to the extent necessary, consult all involved partners in order to prepare complete reports. The reports shall be delivered via SIU's online system Espresso.

#### **D.3 Programme specific provisions**

None.

#### **D.4 Project specific provisions**

None.

### **General conditions**

#### **General conditions**

##### **Article 1 - Definitions**

Subject to specific definitions made in the Special Conditions, the following terms shall have the meaning ascribed to them below:

**Auditor General:** The Office of the Auditor General of Norway ([www.riksrevisjonen.no](http://www.riksrevisjonen.no)).

**Force Majeure:** A hindrance outside a party's control which is partly or wholly preventing it from performing its obligations under the Contract, and which could not reasonably have been foreseen or overcome.

**Project:** The project described in the Project Document.

**Project Coordinator:** The person designated as such in Section A.1 and A.2 of the Project Description.

**Project Description:** The information set out in Sections A – E.

**Project Results:** All results produced or achieved through the Project and capable of being protected under any intellectual property law, regardless of their form, nature and localization.

##### **Article 2 - Project administration**

The Institution in Norway shall make its utmost efforts to ensure that the Project is implemented in accordance with the Project Document, and proactively seek to formalize and coordinate project activities with all involved personnel and partners. The Project Coordinator shall ensure that all notification and reporting obligations set out herein are duly complied with.

The Institution in Norway shall ensure **(a)** that the implementation of the Project comply with all applicable statutes, laws and regulations in force or entering into force in the project period, as well as recognised norms for good project governance; and **(b)** that adequate steps shall at all times be taken to prevent/mitigate risk of irregularities, corruption and/or other unethical practices, in compliance with the «Guidelines for handling irregularities» (accessible on SIU's webpage).

The Institution in Norway warrants that the Funds (including any interest earned thereon) will be used exclusively for the purposes of implementing the Project, and that the project management will establish appropriate procedures for managing the Project's financial aspects (budgeting, accounting, reporting, etc.).

### **Article 3 - Disbursement, transfers and reservations**

All disbursement obligations on part of SIU are subject to SIU's receipt of the allocation made under the Programme and any instructions from the entity/ies ultimately funding the Programme.

SIU shall be forthwith notified if the Project is likely to receive grants or other similar funding from other public or private persons/entities. If such alternative funding results in a reduction of the own share of the Institution in Norway or its partners receiving a part of the Funds in the Project, SIU may reduce the Funds accordingly. The Institution in Norway shall be consulted before any such reductions are made.

If, after the Project has been completed there exist any unused part of the Funds, such amount shall be repaid to SIU according to invoice. If the Funds are insufficient to ensure due completion of the Project, the Institution in Norway shall pay the amount necessary to complete the Project.

SIU accepts no liability for loss due to unfavorable exchange rates, errors in banking details provided, or adverse tax implications, and SIU will not cover any bank related costs/charges. Return of funds to SIU shall be made in the same currency as the disbursement from SIU.

### **Article 4 - Accounting, verification and audits**

The Institution in Norway shall keep a separate project account for the Project, specifying the actual income and costs in the Project. The project account shall be kept current and in all respects be compliant with internationally recognised accounting principles, and form part of the Institution in Norway's formal accounts.

SIU and the Auditor General shall be entitled at any time to verify that the Funds are being applied in accordance with the Contract, and shall upon request be forthwith presented with receipts, time sheets, calculations and any other relevant documentary evidence necessary to carry out such verifications, and be allowed to inspect the progression of project activities and results. SIU reserves the right to carry out random audit checks without any prior notice.

### **Article 5 - Reporting**

If SIU at any time finds the reporting obligations set out in Article D.2 insufficient to meet SIU's needs for information regarding the Project, SIU may amend the reporting obligation to meet such needs. Such amendments shall be notified well in advance and not be unreasonable.

Unless otherwise specified, all reporting pursuant to the Contract shall be made through SIU's online system "Espresso" (<http://espresso.siu.no>). All reporting on budgets and accounts shall be made in the same currency as the Funds.

### **Article 6 - Transfer of a part of the Funds to third parties**

Insofar necessary in order to implement the Project, the Institution in Norway may transfer parts of the Funds to other institutions in Norway or abroad.

The Institution in Norway must ensure that the recipients of such transfers undertake to provide it with sufficient documentation to comply with its accounting and reporting obligations under this Contract.

Except from scholarships paid out to students in pursuance of the Project, salaries to personnel at the Institution in Norway and other amounts customarily paid out directly to personnel involved in such projects (e.g. per diem and the like), no part of the Funds may be transferred directly to any private person in Norway or abroad without SIU's prior written consent.

#### **Article 7 - Liabilities and indemnifications**

SIU's legal and financial responsibility in respect of the Project is strictly limited to its obligation to disburse the Funds in accordance with the terms and conditions of the Contract.

The Institution in Norway shall keep SIU fully indemnified from all risk, liabilities, claims, proceedings and any other adverse or potentially adverse effects whatsoever arising out of or in connection with the Project and/or the personnel/partners involved.

#### **Article 8 - Use, publication and protection of Project Results**

Unless otherwise agreed, the Institution in Norway shall publish the Project Results without undue delay after completion, and the Project Results shall thereafter remain available to the public on reasonable terms. Insofar necessary to secure such public access to the Project Results, SIU shall enjoy a royalty-free, non-exclusive, non-commercial right to translate, reproduce and distribute the Project Results, subject only to payment of costs necessary to facilitate such use.

Presentations of the Project and/or the Project Results to the public shall mention that the Project is funded by SIU and the relevant ministry under the Programme. Presentation to the public includes any presentation in any form to any part of the public.

#### **Article 9 - Transfer of rights and use of sub-contractors**

The Institution in Norway may not transfer, mortgage or otherwise pledge any of its rights and/or obligations under the Contract, without the prior written consent of SIU. The use of sub-contractors does not release the Institution in Norway from its obligations under the Contract, and sub-contractors may not be granted any form of entitlement to Project Results. Transfer of rights relating to the Project Results shall not prejudice SIU's rights pursuant to Article 8.

#### **Article 10 - Deviations from the Project Document**

Significant deviations from the project implementation procedure set out in the Project Document shall be forthwith notified to SIU in writing, and may not be deferred to the annual progress report. A deviation shall be considered significant **(a)** if it is likely to have an adverse effect > 20 per cent on the Project's yearly budget or progress; **(b)** if it involves changes to the Project management (hereunder the Project Coordinator or central academic personnel) in the Institution in Norway or any of its partner(s); or **(c)** if the deviation leads to any other major changes in the Project's implementation as set out in the Project Document (e.g. cancellation or considerable alteration of central project activities, damage or loss of key infrastructure, etc.).

The notice to SIU shall describe the deviation(s) and set out which measures have been/will be implemented to avoid/mitigate its effects and the prospect of such measures' success. Upon receipt of the notice, SIU will assess which impact the deviation(s) shall have on the Contract. Until SIU has responded, the Institution in Norway shall refrain from major financial dispositions in relation to the Project (e.g. payout to partners, accept comprehensive obligations, etc.) and to the extent possible seek to impose the same restriction on its partner(s).

If the deviation is remediable, SIU shall provide the Institution in Norway with a reasonable number of days to either remedy the deviation (grace period), or propose an amendment to the Project Document which mitigates its prejudicing effects or is otherwise agreeable. If the deviation is not remedied within

the grace period, and no reasonable amendment of the Project Document is made available, SIU may discontinue its funding of the Project and instruct the Institution in Norway to immediately repay, and seek repaid from its partner(s), any unused part of the Funds. The Institution in Norway and its partner(s) shall be duly consulted before such discontinuation.

#### **Article 11 - Breach of the Contract**

Upon anticipated or occurred breach of the Contract, or reasonable suspicion thereof, SIU may wholly or partly suspend its disbursement of the Funds, and instruct the Institution in Norway to immediately (a) suspend the use of any part of the Funds already paid out to it, and (b) seek suspended the use of any part of the Funds paid out to its partner(s). Such instructions shall be confirmed in writing without undue delay.

The Institution in Norway shall always be provided with a reasonable number of days to rectify a breach (grace period). If the breach has not been rectified within the grace period, SIU may terminate the Contract and instruct the Institution in Norway to immediately repay, and seek repaid from its partner(s), any unused part of the Funds.

If the breach is substantial, SIU may instruct the Institution in Norway to immediately (a) repay, and seek repaid from its partner(s), any part of the Funds (whether used or not); and (b) transfer, and seek transferred from its partner(s), all rights to the Project Results and infrastructure primarily paid for by the Funds. Substantial breach includes, but is not limited to, (i) any act of fraud, corruption or other unethical practice by the Institution in Norway, its personnel or partner(s); (ii) anticipated or actual bankruptcy, dissolution or other winding up of the Institution in Norway or its partner(s); (iii) transfer of majority ownership and/or control in the Institution in Norway to an entity having jurisdiction outside the EEA; (iv) failure to abide by the rules referred to in Article 2; (v) failure to exclusively use the Funds on the Project in accordance with Article 2; (vi) failure to comply with audit requests in accordance with Article 4; (vii) failure to report to SIU in accordance with Article 5; (viii) failure to notify SIU of significant deviations in accordance with Article 10; and (ix) any other substantial and continued failure to perform obligations under the Contract.

#### **Article 12 - Force Majeure**

If a breach of the Contract or a significant deviation from the Project Document is resulting solely from Force Majeure, the sanctions set out in Articles 10 and 11 may not be used.

If, however, the Force Majeure results in a situation where it is unlikely that the Project may be completed in accordance with the Project Document, or in any other reasonable way yielding similar results to those sought achieved in the Project, SIU may discontinue its funding of the Project and instruct the Institution in Norway to immediately repay, and seek repaid from its partner(s), any unused part of the Funds. The Institution in Norway and its partner(s) shall be duly consulted before such discontinuation.

#### **Article 13 - Miscellaneous provisions**

SIU generally reserves the right to invoke any rights and remedies it may have under Norwegian law.

Failure to exercise, or any delay in exercising, any right or remedy under the Contract or any applicable law, shall not in any way constitute a waiver of that or any other right or remedy, and no single or partial exercise of any such rights or remedies shall preclude or restrict the further exercise of such rights or remedies.

Any decision made by SIU in pursuance of Articles 10, 11 and 12 shall be deemed final. Such decisions may only be challenged through the procedure for settlement of disputes in Article 14.

This Contract does not confer any rights or remedies on third parties.

**Article 14 - Settlement of disputes**

The Contract shall be governed by and interpreted in accordance with Norwegian law. Any dispute arising out of or in connection with the Contract shall be sought resolved amicably. If the dispute cannot be resolved amicably, the Norwegian ministry (or such other entity) in charge of the Programme shall have absolute discretion to resolve the matter.

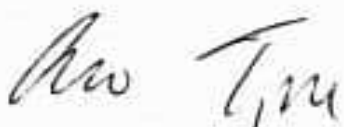
**Bank information**

**Bank details**

**Bank name** DNB  
**Bank address** Dronning Eufemias gate 30, 0191 OSLO  
**Bank account holder** Universitetet i Bergen  
**Bank account number** BANK ACCOUNT: 76940500857; IBAN: NO5276940500857; SWIFT: DNBANOKKXXX  
**Payment reference** CPEA-2015/10119 /154100

**Signatures**

**Signature - Norwegian Centre for International Cooperation in Education (SIU)**

Date: 24/5 116	Signature: 
Position: Dep. DG	Dep. Director General Gro Tjore

**Signature - Institution in Norway**

**Legal representative**

Date: 10/5 - 2016	Signature: 
Position: Director of Student Affairs	

**A - Information on the partnership**

**A.1 Main partner institution in Norway**

**Main partner institution in Norway (IIN)**

University of Bergen (NO-UIB)

**Department (IIN)**

Department: Department of Geography

**Head of department (IIN)**

Name: Dahl, Svein Olaf

Email: Svein.Dahl@uib.no  
Phone number: +47 5558 3065

### Project coordinator (IIN)

Name: Wheat, David  
Gender: Male  
Email: david.wheat@uib.no  
Phone number: +47 4034 8911

## A.2 Main partner institution outside Norway

### Main partner institution outside Norway (IoN)

National University "Kyiv-Mohyla Academy" (UA-NaUKMA)

### Department (IoN)

Department: Department of Finance

### Head of department (IoN)

Name: Lukianenko, Iryna  
Gender: Female  
E-mail: luk@kse.org.ua  
Phone number: +38044 425-60-42

### Project coordinator (IoN)

Name: Lukianenko, Iryna  
Gender: Female  
Email: luk@kse.org.ua  
Phone number: +38 050 311-13-38

## A.3

### Network partners

Institution: UA-Ivan Franko National University of Lviv (UA)  
Unit: Department of Mathematical Economics and Econometrics  
Contact person: Kyrylych, Volodymyr  
Gender: Male  
Degree: Doctor of Physics & Mathematics, Professor  
Position: Head of Department of Mathematical Economics and Econometrics  
E-mail: vkyrylych@ukr.net  
Phone number: +38 067-67-14-390

## A.4

### Participants in the project

Name: Buy, Tetiana  
Gender: Female  
Degree: PhD  
Position: Associate Professor  
Institution: UA-National University "Kyiv-Mohyla Academy"

Name: Dadashova, Pervin  
Gender: Female  
Degree: Master in Finance  
Position: PhD candidate in Finance  
Institution: UA-National University "Kyiv-Mohyla Academy"

Name: Davidsen, Pål

Gender:	Male
Degree:	Magister Artium (Mag Art) (Ph D) in Information Science
Position:	Professor of System Dynamics
Institution:	NO-University of Bergen
Name:	Donkoglova, Natalia
Gender:	Female
Degree:	Master in Pedagogy
Position:	Methodologist of academic work at the Finance Department
Institution:	UA-National University "Kyiv-Mohyla Academy"
Name:	Faryna, Oleksandr
Gender:	Male
Degree:	Master in Finance
Position:	PhD candidate in Finance
Institution:	UA-National University "Kyiv-Mohyla Academy"
Name:	Ivakhnenkov, Serhiy
Gender:	Male
Degree:	Doctor of Economics
Position:	Professor
Institution:	UA-National University "Kyiv-Mohyla Academy"
Name:	Kopainsky, Birgit
Gender:	Female
Degree:	PhD in Agricultural Economics
Position:	Post-doc researcher
Institution:	NO-University of Bergen
Name:	Kyrylych, Volodymyr
Gender:	Male
Degree:	Doctor of Physics & Mathematics
Position:	Head of Department of Mathematical Economics and Econometrics, Professor
Institution:	UA-Ivan Franko National University of Lviv
Name:	Lytvyn, Anton
Gender:	Male
Degree:	Master in Finance
Position:	PhD candidate in Finance
Institution:	UA-National University "Kyiv-Mohyla Academy"
Name:	Moxnes, Erling
Gender:	Male
Degree:	PhD in Engineering
Position:	Professor of System Dynamics
Institution:	NO-University of Bergen
Name:	Oliskevych, Marianna
Gender:	Female
Degree:	PhD
Position:	Associate Professor
Institution:	UA-Ivan Franko National University of Lviv
Name:	Oliskevych, Marianna
Gender:	Female
Degree:	PhD

Position:	Associate Professor
Institution:	UA-Ivan Franko National University of Lviv
Name:	Primierova, Olena
Gender:	Female
Degree:	PhD
Position:	Associate Professor
Institution:	UA-National University "Kyiv-Mohyla Academy"
Name:	Shportyuk, Volodymyr
Gender:	Male
Degree:	PhD
Position:	Associate Professor
Institution:	UA-National University "Kyiv-Mohyla Academy"
Name:	Stelmashenko, Iaroslava
Gender:	Female
Degree:	Master in Finance
Position:	PhD candidate in Finance
Institution:	UA-National University "Kyiv-Mohyla Academy"

## B - Information on the project

### B.1 Description of the project

#### Project goals, activities and expected results

##### B.1.1 Please state the overall project goals

B.1.1 Our overall goal is to extend our successful capacity-building efforts for Learning Economics with Dynamic Modeling (E-LEDM) by achieving four primary goals: (1) developing capacity at an additional Ukrainian university in addition to extending and deepening the capacity development underway at NaUKMA, (2) engaging with economists at the central bank in Ukraine, (3) assisting secondary schools in Ukraine, and (4) developing a double-degree program for students qualifying in Norway and Ukraine.

1. First, after three years of successful capacity-building collaboration between the System Dynamics Group at the University of Bergen in Norway (UiB) and the Finance Department at National University of Kyiv-Mohyla academy in Ukraine (NaUKMA), we are extending our partnership to include a third Ukrainian institution: the Department of Mathematical Economics and Econometrics at the Ivan Franko Lviv National University in Lviv (LNU). Just as there has been a history of collaboration between NaUKMA and UiB, a significant relationship between NaUKMA and LNU has developed over the past two years, with LNU mathematics professors participating in NaUKMA conferences and NaUKMA finance department professors participating in seminars at LNU. NaUKMA and LNU professors have also collaborated on joint publications, and NaUKMA professor Lukianenko serves on the dissertation committee of a LNU doctoral student. As LNU professors learned about the NaUKMA/UiB dynamic modeling education and training program, they expressed enthusiastic interest in joining our project team and developing dynamic modeling capacity at LNU. Thus, our first primary goal is to continue dynamic modeling capacity-building at NaUKMA and begin similar capacity-building at LNU. It is important to understand that capacity building requires more than Ukrainians traveling to Norway to get training in modelling methods and techniques. It involves institutionalising the new capacities 'back home' in ways that generate a mutually reinforcing process that is sustainable within NaUKMA and LNU. That is why we emphasize curriculum changes involving new courses and new ways to teach old courses. And it's also why we emphasize utilising the new skills in research projects in collaboration with senior scholars, dissemination of the research findings in scientific journals and conferences, and building international collegial networks that provide support and motivation for further development of the dynamic modelling skills.

2. Our second primary goal is to engage economists at the National Bank of Ukraine (NBU, the central bank) in seminars and workshops that demonstrate how system dynamics (SD) modeling can add value to a monetary economists' analytical skill set. UiB professor Wheat has relevant experience for such an engagement, having conducted similar workshops at Lithuania's central bank in 2014 and 2015 and because he is currently supervising a UiB master thesis student on a research project requested by the Bank of Lithuania. In addition, two of the NaUKMA PhD students who learned SD modeling at UiB over the past three years are now working at the National Bank of Ukraine, as are other former students of NaUKMA professor Lukianenko.

3. The third goal—assisting secondary schools in Ukraine—was first envisioned by NaUKMA professor Primerova. The goal is that at least two secondary schools ('videregående skoler' på norsk), one in Kyiv and another in Lviv, will become interested in learning how age-appropriate SD-based modeling can improve student learning of economics, mathematics, and the natural sciences. UiB professor Wheat has a close professional relationship with several secondary school teachers in the United States who use SD modeling to enrich their teaching as well as with the Creative Learning Exchange, an established organization with a vision of "developing system citizens in K-12 education" (<http://www.clexchange.org>). Moreover, other UiB members of the project team, professors Davidsen and Moxnes, have experience working with secondary school teachers in Norway.

4. Our fourth goal is to achieve commitments to double-degree programs among the three university partners in our project. The SD Group at UiB is one of the founders of a four-university Erasmus Mundus consortium that grants joint and multiple degrees for the European Master in System Dynamics (<http://europeansystemdynamics.eu>), in addition to having a double-degree PhD degree program with the University of Palermo in Italy.

All of these efforts are expected to help us establish a collaborative center of excellence devoted to dynamic modeling of economic systems. The modeling methods would include system dynamics, econometrics, and financial and economic analytics. The center would be located at NaUKMA in Kyiv and would function as a collaborative enterprise involving the Finance Department at NaUKMA, the System Dynamics Group at UiB, and the Mathematics Department at LNU.

**B.1.2 Please outline in brief a work plan for the project and describe how the activities will contribute to the achievement of the project goals**

1. Our E-LEDM strategy for extending dynamic modeling capacity-building more deeply at NaUKMA and initially at LNU is the same three-part strategy we have successfully followed for three years in the original LEDM project: (a) train the trainers in Norway, (b) train on-site in Ukraine, and (c) provide online training to sustain the collaboration in the years ahead.

(1a) During each autumn semester, 2016-19, about 10 master and PhD students from NaUKMA and LNU will take the three foundation courses in system dynamics modeling at UiB, along with about 50 other international students who enroll in our program each year. In addition, a special topics course in dynamic modeling—designed specifically for the small group of Ukrainian students—will be offered to the NaUKMA and LNU students.

(1b) In addition to enhancing their modeling skills, the Ukrainian students will learn pedagogical and presentation skills to enable them to train their colleagues in workshops and courses after they return to Kyiv and Lviv. The first SD course at NaUKMA began in September 2014, and it is taught by one of the PhD students who learned SD modeling at UiB. Three young NaUKMA professors also studied SD at UiB and have developed lectures and case studies that utilize SD concepts and methods. Under E-LEDM, we expect these initiatives to expand at NaUKMA and to get started at LNU. These Ukrainian-led training sessions will be offered each semester, beginning in the spring semester of 2017 after the first cohort of E-LEDM students returns to Ukraine. Moreover, UiB professor Wheat will conduct at least one workshop and/or lecture at NaUKMA and LNU each semester, beginning in the spring semester of 2016.

(1c) The first online course linking UiB and NaUKMA—Economic Dynamics—was developed by UiB professor Wheat and the course began in September 2015, and will be offered during autumn semesters to students at NaUKMA and LNU. An Advanced Economic Dynamics course will also be developed by professor Wheat for delivery during spring semesters, beginning in 2018.

(1d) An important capacity-building use of the project funds will be to sponsor participation in international scientific conferences. Dissemination of research enhanced by dynamic modelling and assessment of curricular change that enables such research will further the professional development of Ukrainian scholars.

2. Senior NBU researcher Roman Lysenko has invited UiB professor Wheat "to conduct an open research seminar and discuss details of future collaborative research." (Wheat has conducted similar seminars at Lithuania's central bank.) This first seminar will occur in April 2016. We expect at least one seminar or workshop per semester (total of 8 during 2016-2019 project period) to teach and reinforce the dynamic modelling methods. Moreover, we expect to produce instructional modelling materials designed for the NBU economists, as well as provide necessary software. NBU is particularly interested in collaboration now because major policy changes—floating exchange rate and inflation targeting—have created a demand for research methods that could be helpful in modelling and forecasting problems related to the new policies. We expect that NBU will identify priority policy issues that will become research tasks for NaUKMA students who, while engaging with NBU economists, would be supervised by professor Wheat and NaUKMA professor Lukianenko, both of whom have extensive macroeconomic modelling experience. In addition to providing policy insights for NBU, we expect the collaborative research to produce jointly-authored scientific publications as well as educate the students about central bank policy-making and operations.

3. Our third goal involves extending our "train the trainers" strategy to include training teachers who will train their students in Ukrainian secondary schools. We will conduct onsite workshops at secondary schools, three national workshops, three national "science fairs" for students, and enable two teachers to take an online course designed for secondary school teachers who use SD to teach regular subjects, especially science and math. To get started, NaUKMA professor Primerova will arrange meetings with teachers and administrators to discuss the advantages that will accrue to secondary students who use age-appropriate SD modeling in their mathematics, natural science, and economics courses. She has already prepared a priority list of schools to contact: Kyiv-Mohyla Collegium, Ukrainian Humanities Lyceum of Taras Shevchenko Kyiv Nation University, Podil Lyceum # 100, and Polytechnic Lyceum of KPI, Lviv Physics and Mathematics Lyceum and Lviv Economic Lyceum. UiB professor Wheat will work with U.S. teachers using SD in the classroom to develop a slide-show presentation that professor Primerova can use in her meetings at the secondary schools. To gain additional guidance for this initiative, international meetings of the project team and U.S. teachers (and the head of the Creative Learning Exchange) will be held at the annual conferences of the System Dynamics Society.

4. Our plans for establishing a double-degree program among our universities are already being discussed. While we are in agreement, we still think it will take 2-3 years to develop PhD and MA double-degree programs because of the bureaucratic procedures in Ukraine and possible changes in university curricula. In April 2016, we will have a meeting in Kyiv, at which time we will specify our next steps.

### **B.1.3 Please describe what concrete results are expected to be achieved through successful implementation of the project**

1. Our E-LEDM strategy for capacity-building at NaUKMA LNU is expected to have the following results during the four years of the project:

- Approximately 44 students from NaUKMA (75%) and LNU (25%) will develop strong system dynamics (SD) modeling skills after taking three foundation courses at UiB. In addition, they will gain experience applying SD modeling methods to problems in both micro- and macro-economics in special topics courses at UiB. Finally, they will develop training and presentation skills that will enable them to share their knowledge upon returning to Kyiv and Lviv.
- Approximately 14 professors from NaUKMA (75%) and Lviv (25%) will gain sufficient SD modeling skills to enrich their own courses after attending short courses, workshops, and seminars at UiB and in their home universities.
- A master level on-site SD course will be developed at NaUKMA, to complement the bachelor level course launched in 2014 and now offered each year.
- Two on-site SD courses—bachelor and master levels-- will be developed at LNU and become operational in 2018 and 2019.

- The first online course in Economic Dynamics, launched in 2015, will be further developed and offered each autumn semester to students at both NaUKMA and LNU.
- A new online course in Advanced Economic Dynamics for students at both Ukrainian universities will be developed and will become operational in the spring semester of 2018.

2. Our E-LEDM plan for engaging economists onsite at the National Bank of Ukraine includes two seminars and/or workshops each year, beginning in April 2016. This initiative is expected to have the following results:

- follow-up collaboration on research projects of policy relevance to NBU and of educational relevance to NaUKMA and LNU.
- Increased understanding of SD methodology among economists at the central bank, as a result of workshops conducted by the project team.
- Internships and career opportunities for a few NaUKMA and LNU students, as a result of at least four thesis research opportunities arising from the project.
- Four published conference papers, jointly authored by bank economists, project team students, and project team leaders.
- At least two jointly authored journal publications.
- Development of policy briefs for the Ukrainian government, resulting from SD-based research.
- First-hand learning experience for Ukrainian students who engage with economists at NBU.
- An enhanced monetary policy course at NaUKMA, including guest lecturers from NBU and UiB.

3. We have an ambitious but realistic plan for encouraging age-appropriate systems thinking and dynamic modelling skills in selected Ukrainian secondary schools ('videregående skoler' på norsk).

- 2016-17: Professors and PhD students from NaUKMA and LNU will conduct introductory workshops at a few selected secondary schools near Kyiv and Lviv. Teachers will receive software and training materials. The universities will provide supportive assistance during the period when the school teachers are getting started with SD-enhance instruction.

- 2017-19: Three annual secondary schools workshops will be conducted in Kyiv (2) and Lviv. Teachers from the collaborating schools will participate, along with others invited from across the nation. A limited number of stipends for participating teachers will be provided, along with books, software, and other training materials. In 2017-18, the workshops will be led by an internationally recognized school teacher who uses SD to enhance her instruction, especially in mathematics, natural science, and economics. In 2019, two Ukrainian teachers will be paid to lead the workshop. At least two Ukrainian teachers will receive scholarships to take an online course specially designed for teachers who want to use SD in the classroom. Two Ukrainian teachers will receive funding to attend the international Creative Learning Exchange conference in the U.S. in 2018, a conference for secondary school teachers using SD.

- 2018-19: Three annual SD modelling 'science fairs' for secondary students will be conducted in Kyiv (2) and Lviv. Qualifying students will receive scholarships to attend and demonstrate their modelling projects. A few teachers will also receive stipends to attend and help the students.

- We expect that these annual events, coupled with the ongoing instructional activities in the schools, will be self-reinforcing and will motivate teachers to use SD-enhance learning methods in the schools of Ukraine.

4. While engaged in international meetings to further the idea for double-degree programs, we will be actively preparing for implementation.

## **Project background**

### **B.1.4 In what way does the project address the objectives and priorities of the programme, as specified in the Call for proposals?**

The E-LEDM project (Extended Learning of Economics with Dynamic Modeling) is consistent with the priorities of the Eurasia Program.

- The collaborative project promises to strengthen the institutional partnership that has been established over the past three years between system dynamicists at UiB and economists at NaUKMA, add to

that partnership the new relationship with the mathematicians at LNU, and strengthen the regional cooperation between NaUKMA and LNU.

- The new study programs are relevant to the needs of Ukraine, a country beset by economic, political, and military challenges. A promising future for Ukraine depends in large part on the establishment of research-based, high-level skills among its young professionals and the establishment of an international network that enables those skills to flourish. The E-LEDM project, with its emphasis on student activity, will contribute to these priority outcomes.

- The potential for engagement with the National Bank of Ukraine and secondary schools in Kyiv and Lviv provides excellent opportunities for NaUKMA and LNU to establish linkages with those public sector enterprises.

- NaUKMA students who participated in the original LEDM project always commented on their increased awareness, interest, and knowledge of Norway, and their appreciation of both the natural beauty of the land and the inner beauty of the kind and generous Norwegians. Likewise, UiB students and staff have greatly admired the intelligence, resilience, work ethic, and patriotism of our new friends from Ukraine. E-LEDM promises more opportunities to extend this mutual appreciation.

- E-LEDM will quadruple the student and staff mobility of the original LEDM projects.

**B.1.5 Please outline the needs addressed by this project, and explain what steps have been taken to identify the demand for the proposed project activities within the primary target group(s)**

The overarching need identified in 2012 by NaUKMA professor Lukianenko was to develop dynamic modeling capacity among the economics and finance professors and students in the Finance Department at NaUKMA. She was highly motivated to meet this need because she was among those consulted by government for economic policy advice, and she concluded that a dynamic (rather than static) modeling methodology that was transparent and easily communicated to policy makers was essential for good policy decisions. This was the motivation for the original LEDM project, and our experience over the past three years has convinced her that we are on the right track and should accelerate our efforts. A similar motivation—improving the dynamic modeling capacity among LNU professors and students—has brought a new partner to the project.

Beyond the improvements in policy analysis, there is also the need to equip NaUKMA and LNU students with high-level skills that will make them more employable and more valuable in both the private and public sectors of Ukraine. NaUKMA's demand for economists with dynamic modelling skills was the spark that began our collaboration several years ago, and new scholars with those skills are the most sought-after today by the Finance Department at NaUKMA. This parallels an increase in dynamic modelling in the economics profession worldwide and the comparative job market advantage of young PhDs whose skills set includes dynamic modelling. The opportunities are not confined to the academic world, as evidenced by the recent hiring of two of LEDM project participants to work in the Department of Monetary Policy & Economic Analysis at the National Bank of Ukraine. Another former LEDM participant has started a small business, and graduates of the SD master's program at UiB have started their professional careers in government agencies, consulting firms, and private companies, in some cases after internships that demonstrated their qualifications to future employers. And the International System Dynamics Society regularly adds to its web-based page of 'job opportunities' for professionally trained dynamic modellers.

From UiB's perspective, this project gives Norway another opportunity to provide support for the people of a nation seeking the freedom and opportunity to build and strengthen cultural, social, and economic bridges to an international community.

**B.1.6 Please describe how each of the involved partners (IiN, IoN and any other network partners) will contribute to the project**

1. For dynamic modeling capacity-building at NaUKMA and LNU, the division of responsibility is:

- NaUKMA and LNU identify and recruit students and professors to learn SD modeling methods at UiB.
- UiB provides Ukrainian students and professors with training in SD modeling methods & training in presentation and teaching skills ("train the trainers").

- NaUKMA and LNU students and professors trained at UiB return to train their colleagues in Kyiv and Lviv, develop new on-site SD modeling courses, and integrate relevant SD concepts and methods into existing courses.
- UiB takes primary responsibility for developing a new online course to be offered at NaUKMA and LNU, but the Ukrainian universities use the project funds to acquire the equipment and software for successful implementation of the online courses. Moreover, NaUKMA and LNU provide logistical and computer lab assistance to facilitate the delivery of the online courses.

2. For engaging the economists and organising seminars and workshops at the National Bank of Ukraine, NaUKMA has the primary responsibility. UiB will assist in conducting the seminars and workshops. Successful spin-off activities (internships and thesis projects for NaUKMA and LNU students, joint research and publication opportunities, and increase utilization of SD modeling methods by central bank economists) depend on the joint efforts of NaUKMA, LNU, and UiB.

3. NaUKMA and LNU have the lead responsibility for reaching out to secondary schools in Ukraine, plus setting up and delivering workshops to teachers and school administrators at the schools. Organising the national workshops and science fairs will also be the primary responsibility of the Ukrainian universities. UiB will contribute to that effort by sharing the knowledge and experience gained in working with secondary school teachers in both Norway and the United States, as well as facilitating contact between SD-enthused teachers in all three countries.

4. All three universities will share in efforts to design, gain approval, and implement double-degree programs.

### **Academic discipline**

#### **B.1.7 Which academic discipline is the project related to?**

- 1: Economics (201)
- 2: Educational sciences, pedagogy and didactics (207)
- 3: Other social sciences (216)
- 4: Computer sciences (302)

## **B.2 Assessment of sustainability and risk**

### **Sustainability**

#### **B.2.1 Please explain how the proposed project activities and the effects sought achieved through the project will be sustained and financed after the project period**

1. Sustainable development of dynamic modeling capacity at NaUKMA and LNU hinges on two instructional activities of the E-LEDM project. The first is the development and implementation of new online, distance learning courses originating at UiB and linking the Norwegian university with the two Ukrainian universities, and—importantly—linking NaUKMA and LNU more closely with each other. Of course, there is no free lunch; even online courses utilize scarce resources. Nevertheless, reducing travel costs associated with delivery of courses across national boundaries will result in a more manageable budget for a sustainable international dynamic modeling educational program. With increased future reliance on Erasmus + resources for student mobility, we hope to draw on other sources for funds to sustain the online portion of our collaboration. The second and even more important activity is the development of on-site classroom courses taught by NaUKMA and LNU professors. As those courses become institutionalized within the Finance Department at NaUKMA and the Mathematics Department at LNU, the chances of sustaining the commitment to dynamic modeling methodologies will rise substantially.

2. The sustainability of the initiative with the National Bank of Ukraine depends entirely on the bank economists' perception of the value added by SD modeling methods, plus their perception of the skills and expertise that NaUKMA and LNU students and professors can provide as interns, consultants, and future employees. To the extent that added value and expertise are demonstrated, we expect that the central bank will have the resources they need to utilize the methodology and the professional expertise. That will have important feedback effects on both NaUKMA and LNU, in terms of expanding research collaboration and enhancing monetary policy education at the two universities.

3. The secondary schools initiative has great potential for rising pay-offs in the future, and sustainability can be envisioned in two ways. First, as the experience in the U.S. and other countries attests, schools that embrace a systems approach to learning and engage their students in the use of modelling tools tend to maintain that strategy. In addition, as more schools become aware of this method of learning and scientific inquiry, they will be motivated to try it. Secondly, to the extent that this initiative is successful in the short run, it will have long-run feedback benefits for NaUKMA and LNA in their continuing efforts to attract outstanding students to their universities. Students trained in systems thinking and dynamic modelling, even at the secondary school level, will be much better prepared for advanced training at the university level. We also want to mention that, under phase III of the original LEDM project, we started developing a network of potential funding sources in the United States—the type of donors who are very interested in the development of Ukraine's educational system at both the secondary and tertiary levels. If we can make some progress working with secondary schools in the E-LEDM project, we will have some specific recommendations to make to foreign donors to sustain that progress. Already, we have obtained from the International System Dynamics Society 28,000 NOK to pay for two Ukrainian students (a PhD student from NaUKMA and a secondary school student) to travel to the U.S. in June 2016 to present their model of the Ukrainian pension system at a conference for secondary school teachers who use system dynamics modelling in their classrooms.

4. Implementation of the double-degree programs will institutionalize the relationships among the three universities, and contribute to sustainability of our initiatives long after this 4-year project has been completed. We do not expect the net financial burden of the double-degree programs to be excessive.

**B.2.2 Please describe how the project is linked to strategies and priorities at the involved partner institutions, and how the project will enhance long-term collaboration between the institutions**  
E-LEDM builds on the foundation laid by the original LEDM project, which was a direct result of a 2008 collaborative agreement between UiB and NaUKMA. Following the formal execution of a "memorandum of understanding" between UiB and NaUKMA in 2008, the UiB Faculty of Social Sciences distributed a letter from which these excerpts are taken: "Avtalen er inngått ved v/Det samfunnsvitenskapelige fakultet og signert av dekanus. Samarbeidsavtalen bygger på et akademisk samarbeid med SV-fakultetet gjennom fagmiljøene knyttet til System Dynamikk. Faglig koordinator for avtalen er førsteamanuensis David Wheat ved Gruppen for systemdynamikk, Institutt for geografi. Den vedlagte avtalen er en bilateral samarbeidsavtale av generell karakter som er inngått på fakultetsnivå. Som det framgår av vedlagte følgeskriv fra David Wheat til Alf Erling Risa er denne avtalen opprettet som et rammeverk med sikte på å styrke forskning og utdanning ved begge institusjoner og med muligheter for samarbeid om felles forskningsprosjekt, utveksling av faglig og pedagogisk kunnskap samt utveksling av stab og studenter. Samarbeidspartnere ser også muligheter for at samarbeidet kan bidra til rekruttering av mastergradsstudenter fra Ukraina til PhDutdanning innen økonomi eller systemdynamikk ved UiB. Videre finnes det interesse i EU for prosjekter i Ukraina, noe som kan åpne for finansiering av felles forskningsprosjekter." (Gundersen and Svensson, 03.09.2008, reference 2008/10673 - EVS).

The extended series of E-LEDM activities builds upon both universities' institutional strategies aimed at fostering international cooperation in education and research. NaUKMA, for example, has 36 agreements for cooperation with foreign universities and institutions from 14 countries, regularly engages in faculty and student exchanges, and conducts research in several educational projects administered by international programs and foundations. The UiB Strategic Plan prioritizes a long-term strategy of international collaboration in education and research. To that end, UiB has multiple bilateral agreements with universities in 17 nations in Africa, 13 nations in Asia, 18 nations in Europe, 11 nations in Latin America, 2 nations in North America, and 2 nations in Oceania. The agreements involving the UiB System Dynamics Group also span those regions.

## Risk assessment

**B.2.3 Please describe any risk factors/difficulties that may impede successful implementation of the project, and how the effects of such risks/difficulties may be mitigated**

Certainly—and for reasons that far exceed the interests of our project—we hope that the international crisis in Ukraine will be resolved soon and in a way that is in the best interest of the people of Ukraine. At the present time, we do not anticipate that complex situation to create impediments to successful implementation of E-LEDM.

In the spirit of full disclosure, we acknowledge that UiB co-coordinator professor Wheat will be required by Norwegian law to retire from his current position when he reaches the age of 70 at the end of September 2017, halfway through the funding period for E-LEDM. However, we do not expect that to impede successful completion of the project for two reasons. First, his colleagues at UiB are responsible for two-thirds of the foundation courses that students will take during the autumn semesters, and there is no doubt that a new instructor will be well prepared to take over Wheat's onsite course—the third in the foundation series. And, during the first two years of the project, Wheat will work with his UiB colleagues to ensure that a new co-coordinator will be fully prepared to take over in late 2017. Second, Wheat's formal E-LEDM role can change without impeding his actual contribution to the project if he receives a temporary appointment at UiB for the duration of the project and an appointment as an adjunct professor at NaUKMA. While no commitments have been made at this time, conversations have begun and that scenario is at least a possibility.

### **B.3 Additional information**

#### **Project summary**

##### **B.3.1 Please provide a short summary of your project (max. 250 words).**

The University of Bergen in Norway (UiB) and two Ukrainian institutions— National University of Kyiv-Mohyla Academy (NaUKMA) and Ivan Franko Lviv National University (LNU)—are collaborating in a project called "Extend the Learning of Economics with Dynamic Modeling." Funded by the Norwegian Centre for International Cooperation in Education and the Norwegian Foreign Ministry, the project's primary educational purpose is building dynamic modeling capacity at NaUKMA and LNU.

The project leaders' strategy is three-fold: train the Ukrainian trainers at UiB, train on-site in Ukraine, and provide online training to sustain the collaboration in the years ahead. During the four-year project, 44 students and 6 early-career professors from NaUKMA and LNU will develop system dynamics modeling skills in Bergen, and gain additional skills to train their colleagues when they return to Ukraine. Traditional on-site classroom courses in system dynamics will also be developed supplemented by two online courses in economic dynamics.

Project leaders also have plans to extend their reach beyond the university classrooms, with seminars and workshops planned for economists at the National Bank of Ukraine, plus workshops, conferences, and student 'science fairs' for secondary school teachers and students in Kyiv and Lviv. The project leaders expect their diverse initiatives to culminate in double-degree programs and a collaborative "Center of Excellence" in Kyiv, devoted to dynamic modeling of economic systems. The center would function as a collaborative enterprise involving the Finance Department at NaUKMA, the System Dynamics Group at UiB, and the Mathematics Department at LNU.

#### **Previous and parallel funding**

##### **B.3.2 Previous funding**

As emphasized throughout this application, E-LEDM is a diverse extension of the original three-phase SIU-funded project "Learning Economics with Dynamic Modeling": CPEA-2012/10078, CPEALA-2013/10124, and CPEALA-2014/10099. The goals of those projects were achieved, making it possible to extend the project activities in new directions with E-LEDM.

Two of the E-LEDM partners (UiB and NaUKMA) recently received an Erasmus+ grant (02 ENI East; AGREEMENT NUMBER - 2015 – 1-N001-KA107-013208) for 98,124 euros to fund NaUKMA student and staff mobility in 2015-16. Most of the money is for NaUKMA students who will travel to Bergen to take the foundation courses in system dynamics at UiB.

##### **B.3.3 Concurrent applications**

No related funding applications are pending or planned.

