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POTENTIAL ECONOMIC BENEFITS OF PROPOSED MAC PROTOCOL

BACKGROUND PAPER

(Submitted by the US Department of Commerce on request of the UNIDROIT Secretariat)

Introduction

1. In anticipation of a substantive economic analysis which is currently under preparation, this paper has been prepared to describe potential economic benefits of the proposed 4th Protocol to the Cape Town Convention on International Interests in Mobile Equipment. The extension of the Cape Town Convention to mining, agricultural and construction (MAC) equipment aims to give end-users better access to low-cost financing, while also opening new markets for equipment manufacturers and potentially creating market opportunities for small businesses in related sectors.

2. This paper is composed of three sections. The first describes the products covered under the proposed Protocol and scope of the relevant industries. The second section discusses prior research on the impact of prior Protocols, and finally the third section describes potential economic benefits.¹

Mining, Agriculture, and Construction (MAC) Machinery

3. Equipment covered under the proposed 4th Protocol includes large machinery that facilitates mining, agriculture, and construction activities. Using the internationally-recognized Harmonized

¹ This paper has been prepared by Natalie Soroka of the International Trade Administration of the U.S. Department of Commerce for the purpose of advancing the work of the UNIDROIT Secretariat, member states, and other parties with an interest in creation of a 4th Protocol to the Cape Town Convention. All opinions expressed in this document are that of the author, and are not intended to reflect the official policy or position of the Department. For more information, please contact Natalie Soroka (202-482-5839; Natalie.Soroka@trade.gov).

System (HS)² classification, 36 HS codes under Chapters 82, 84, and 87 were identified as appropriate for consideration and possible inclusion under the future MAC Protocol.³

4. Worldwide, international trade in the identified products totalled \$114.1 billion in 2015⁴, and has grown 9.4 percent annually over the past ten years. In comparison, total global goods trade has grown by 5.7 percent, on average, during this period. Germany led the world as an exporter of this equipment, followed by the United States, Japan, China, and the United Kingdom. In recent years, China has emerged as a major supplier, rising from the 15th largest exporter in 2005 to the 5th largest by 2008.

5. In 2015, nearly half of imports in the identified products went to Europe, followed by markets in North America and Asia. However, over the past ten years import demand in other regions such as North Africa, Central and South America, Sub-Saharan Africa, the Middle East, and Asia have all averaged double-digit growth each year. Imports of the identified equipment into North Africa in 2015 were triple that of 2005, and similarly imports have more than doubled to South and Central America and the Middle East. While its imports have fallen in recent years, Russia also remains a major market for this equipment. Prior to 2014, Russia had averaged 16 percent annual growth in imports of MAC machinery since 2004 and accounted for more than half of the growth in MAC machinery imports to European markets outside of the European Union. While a much smaller market, over the same period Ukrainian imports of this equipment averaged 8 percent annual growth. Comparatively, imports into the European Union (including intra-EU trade) averaged 4 percent growth between 2004 and 2014.

Literature Summary

6. There have been several studies evaluating the benefits of prior Cape Town Convention Protocols, the most detailed considering the Aircraft Protocol. Insofar as the MAC Protocol is similar, it is possible to use this research to infer benefits that could likewise affect this equipment.

7. The Dynamic Asset Financing Model (DAFIM), developed by Vadim Linetsky of Northwestern University⁵, was used to estimate the impact of the Aircraft Protocol, focusing particularly on rights in insolvency. This research found that reducing repossession delay has a significant impact on the loss-given-default of a standard loan. By reducing the level of risk facing lenders, borrowers have access to improved lending terms, thus lowering the cost of financing. In addition, Linetsky found that these benefits are increased when applied to lower-rated borrowers or those located in jurisdictions with longer enforcement delays.

8. While the 2009 study takes a narrow view, only taking into account direct impacts on given transactions in order to estimate specific effects, an earlier assessment of the Aircraft Protocol argued that there is the potential for significant direct and indirect economic benefits.⁶ Saunders

² The Harmonized System (HS) is a global system developed by the World Customs Organization to achieve uniform classification of commodities or merchandise in international trade. Covering approximately 5,000 commodity groups, this classification system is standardized between countries at a basic six-digit level of detail. Amended every five or six years, the Harmonized System is the standard classification used in more than 200 countries and territories worldwide for trade negotiations, rules of origin, customs tariffs, and the collection of international trade statistics. It is considered a universal language or code for goods. The HS codes used in this paper refer to the 2012 version of HS nomenclature.

³ See attached Appendix A for a list of Harmonized System (HS) codes determined to be appropriate for consideration.

⁴ UN Comtrade Database, accessed via the Trade Policy Information System (<http://tpis.trade.gov>). Data retrieved 06 February 2017. Unless otherwise stated, trade is represented by reported global imports.

⁵ Linetsky, Vadim "[Economic Benefits of the Cape Town Treaty](#)." 18 October 2009.

⁶ Saunders, Anthony and Ingo Walter. "[Proposed UNIDROIT Convention on International Interests in Mobile Equipment, as Applicable to Aircraft Equipment Through the Aircraft Equipment Protocol: Economic Impact Assessment](#)." September 1998.

and Walter (1998) note World Bank research suggesting a causal link between a country's financial development and economic growth, indicating the potential for legal improvements to affect the economy as a whole. Commercial air transportation, in that it "incorporates an inherently high level of technology," and significantly impacts total factor productivity, enables changes in this industry to have widespread macroeconomic impacts⁷. Similarly, mining, agriculture, and construction equipment directly impact food production and infrastructure, thus also affecting a country's overall productivity.

Potential Economic Benefits

9. As previously noted, a direct impact of this proposal would be to lower the risk associated with the purchase of this machinery, thereby lowering the "costs" to finance the sale. As covered in Mooney et al (2016), to the extent that this encourages purchases of MAC equipment, there would be direct benefits to the manufacturer through higher sales and to the buyer in the form of more secure financing and better lending terms, lowering transaction costs.⁸

10. The economic benefits of this proposal have the potential to extend beyond those directly involved in the sale and financing of this machinery, as well. One rationale for proposing the addition of a fourth protocol covering MAC equipment was to "allow enterprises engaged in agriculture, construction and mining the ability to acquire equipment they would otherwise not be able to acquire and thus to *permit them to optimise their activity*,"⁹ (emphasis added). As the equipment covered under the proposed protocol facilitate food production and infrastructure improvements, it is reasonable to expect general benefits to domestic production, food security, and infrastructure development.

11. The United Nations projects that world population will reach 9.7 billion by 2050¹⁰, with Africa accounting for more than half of this growth. In order to satisfy this demand, it's projected that global food production must increase by 60 percent, though in some developing countries growth would need to be much higher.¹¹ As land becomes more scarce, this production will increasingly need to come from higher crop yield and intensity rather than expansion of arable land. Agricultural mechanization, particularly when combined with other methods such as irrigation, fertilizers, pesticides, and the development of high-yield seed varieties, offers a way to optimize production.

12. Several studies¹² assessing the impact of agricultural mechanization have found increased mechanization to have positive impacts on production, productivity, labor, and incomes. In a review of literature assessing agricultural mechanization in India, Verma (2008) noted that nearly all the reviewed studies agreed on several broad conclusions, including:

- (i) That farm mechanization led to increase in inputs on account of higher average cropping intensity and larger area and increased productivity of farm labour.

⁷ Ibid., 32.

⁸ Charles W. Mooney, Jr., Marek Dubovec, William Brydie-Watson; The mining, agricultural and construction equipment protocol to the Cape Town Convention project: The current status. *Uniform Law Review* 2016; 21 (2-3): 332-360.

⁹ International Institute for the Unification of Private Law. [Study LXXIJK – Development of a Fourth Protocol to the Cape Town Convention on Matters Specific to Agricultural, Construction and Mining Equipment](#).

¹⁰ United Nations, Department of Economic and Social Affairs, Population Division (2015). [World Population Prospects: The 2015 Revision, Key Findings and Advance Tables](#). Working Paper No. ESA/P/WP.241.

¹¹ Food and Agricultural Organization of the United Nations. [World Agriculture Towards 2030/2050: The 2012 Revision](#). ESA Working Paper No. 12-03, June 2012.

¹² Verma, S.R. (2008). [Impact of Agricultural Mechanisation on Production, Productivity, Cropping Intensity, Income Generation and Employment of Labour: Status of Farm Mechanisation in India](#). Punjab Agricultural University, Ludhiana.

- (ii) That farm mechanization increased agricultural production and profitability on account of timeliness of operation, better quality of work done and more efficient utilization of inputs.
- (iii) That farm mechanization increases on- farm human labour marginally, whereas the increase in off- farm labour such as industrial production of tractors and ancillaries was much more.
- (iv) That farm mechanization displaced animal power to the extent of 50 to 100% but resulted in [less] time for farm work.¹³

13. Developed countries, particularly those in Europe, generally have higher levels of agricultural mechanization compared to developing economies. Using data provided from the U.N. Food and Agriculture Organization, the World Bank reported¹⁴ that member countries¹⁵ of the Organization for Economic Cooperation and Development averaged 463 tractors per 100 square kilometers of arable land in 2000. In comparison, lower middle income countries averaged only 93 tractors per 100 square miles, indicating that these countries could benefit from increased access to agriculture machinery.

14. Beyond agriculture, greater access to construction machinery offers the potential for improved infrastructure, a key component of economic growth. Research over the past several decades has presented significant evidence that the, "quantity and quality of infrastructure can directly raise the productivity of human and physical capital and hence growth,"¹⁶ through greater access to markets, education, electricity, water, and communication. Recent studies found that a 1 percent increase of physical infrastructure, such as roads, in a developing country can cause GDP growth to accelerate up to two percentage points in the short term.¹⁷

15. With regard to labor, research suggests that access to this type of equipment has a positive impact on employment and incomes. Due to higher yields and cropping intensity¹⁸, labor demand in the agriculture sector actually increases as a result of mechanization. In addition to farm labor, mechanization increases the demand for labor in other related sectors,¹⁹ offering an entrepreneurial opportunity for small local businesses to establish dealerships to facilitate sales or provide repair and routine maintenance services.

¹³ Verma, S.R. (2008).

¹⁴ Latest data available. World Bank, World Development Indicators, "[Agricultural machinery, tractors per 100 sq km of arable land.](#)"

¹⁵ The 35 members of the Organization for Economic Cooperation and Development are often used in macroeconomic indicators as a grouping of "developed" economies. These member countries are: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

¹⁶ Estache, Antonio and Grégoire Garsous. "[The impact of infrastructure on growth in developing countries.](#)" IFC Economics Notes, Note 1. April 2012.

¹⁷ Dethier, Jean-Jacques and Alexander Moore. [Infrastructure in developing countries: An overview of some economic issues.](#) ZEF-Discussion Papers on Development Policy No. 165. Center for Development Research, Bonn. April 2012.

¹⁸ Defined by the [Food and Agriculture Organization of the United Nations \(UNFAO\)](#) as, "The fraction of the cultivated area that is harvested. The cropping intensity may exceed 100 percent where more than one crop cycle is permitted each year on the same area. In AQUASTAT, the cropping intensity has been calculated on irrigated crops only, and becomes practically the ratio of the harvested irrigated areas over the area equipped for full control irrigation actually irrigated. Irrigation, by decoupling the crop production from the natural precipitation, increases cropping intensity in countries where temperatures are not a limiting factor."

¹⁹ Verma, S.R. (2008).

Conclusion

16. The addition of a MAC Protocol presents several potential economic benefits. For those parties directly involved in a transaction, greater accessibility to financing has the ability to positively impact producers and financiers while allowing buyers greater access to this equipment. In addition, given the efficiency and productivity gains of using such equipment, it's reasonable to expect broader economic gains to production, labor, and food security.

Appendix A**Codes for Inclusion**

Harmonized System Code (6-digit)	Harmonized System Description
820713	RCK DRLNG EARTH BORNG TLS WRKNG PT CERMETS, & PTS
842481	AGRICULTURAL OR HORTICULTURAL MECH SPRAYERS ETC
842641	DERRICKS ETC SELF-PROPELLED ON TIRES, NESOI
842649	DERRICKS ETC SELF-PROPELLED NOT ON TIRES, NESOI
842911	BULLDOZERS AND ANGELDOZERS, SELF-PROP, TRACK LAY
842919	BULLDOZERS AND ANGLEDZERS, SELF-PROP NESOI
842920	GRADERS AND LEVELERS, SELF-PROPELLED
842930	SCRAPERS, SELF-PROPELLED
842951	MECH FRONT-END SHOVEL LOADERS, SELF-PROPELLED
842952	MECH SHOVELS EXCAVATORS ETC W 360 DEGREE SPRSTRUC
842959	MECH SHOVELS, EXCAVATORS AND SHOVEL LOADERS NESOI
843010	PILE-DRIVERS AND PILE-EXTRACTORS
843031	COAL OR ROCK CUTTERS & TUNNEL MACH, SELF-PROPELLED
843039	COAL OR ROCK CUTTERS & TUNNEL MACH, NESOI
843041	BORING OR SINKING MACHINERY, NESOI, SELF-PROPELLED
843049	BORING OR SINKING MACH NESOI, NOT SELF-PROPELLED
843050	MOVING, GRADING ETC MACHINES ETC NESOI, SELF-PROP
843061	TAMPING OR COMPACTING MACHINERY,NOT SELF-PROPELLED
843069	MOVING, GRADING ETC MACHINES ETC NESOI, NO SELF-PR
843210	PLOWS FOR SOIL PREPARATION OR CULTIVATION
843221	DISC HARROWS
843230	SEEDERS, PLANTERS AND TRANSPLANTERS
843240	MANURE SPREADERS AND FERTILIZER DISTRIBUTORS
843340	STRAW OR FODDER BALERS, INCLUDING PICK-UP BALERS
843351	COMBINE HARVESTER-THRESHERS
843680	AGRIC, HORT, FOREST, BEE-KEEPING MACHINERY NESOI
847431	CONCRETE OR MORTAR MIXERS
847432	MACH FOR MIXING MINERAL SUBSTANCES WITH BITUMEN
847910	MACHINERY FOR PUBLIC WORKS, BUILDING OR THE LIKE
847982	MIXING KNEADING CRUSHING GRINDING ETC MACHIN NESOI
870130	TRACK-LAYING TRACTORS
870190	TRACTORS, NESOI
870410	DUMPERS DESIGNED FOR OFF-HIGHWAY USE
870510	MOBILE CRANES
870540	CONCRETE MIXERS, SPECIAL PURPOSE VEHICLES
871620	SELF-LOADING OR SELF-UNLOADING TRAILERS,SEMI-TRAIL