THE UAVS IN INTERNATIONAL TRADE AND LOGISTICS – NEW CHALLENGES AND REGULATION

Iveta Černá, Eva Křenková

Abstract: The paper is focused on the unmanned aerial vehicles (UAVs) in international trade and regulation, while special attention is paid to the position of trade and production leaders, categorisation of UAVs according to performance parameters, and last but not least, to MFN rates applied to imports of UAVs under six relevant HS codes. Indeed, given the security aspects, UAVs are subject to a wide range of regulatory issues that shape their trade flows and application possibilities. This is *inter alia* reflected in their actual employment in logistics. The national states vary in terms of regulations applied, yet, e.g., within the EU, a common UAV regulatory framework will come into force on July 1, 2020, which is likely to give an additional impetus to the UAV market. The objective of the paper is to present the current state of play in the international trade in UAVs, analyse the novel regulation issues at the EU as well as the U.S. levels, and draw conclusions concerning the further proliferation of delivery drones within the EU and the U.S. We further develop, broaden, and update the topic of the original paper (Černá, 2016) and enrich it with the deeper insight into the customs and regulatory issues.

Keywords: unmanned aerial vehicle, drone, RPAS, UAS
JEL Classification codes: F13, F14, F52, L93.

Introduction

The UAVs as a relatively new industry attract attention of both researchers and security experts. Furthermore, the UAVs as military vehicles received a great deal of worldwide media attention after drone attacks on Saudi Arabia's Aramco oil installations allegedly led by Iran in September 2019 (The Guardian, 2019) as well as after the subsequent US drone strike killing Qasem Soleimani, top Iranian commander in January 2020 (CNN, 2020).

Nonetheless, the UAV market is much larger than covering merely the military mission vehicles. In 2018, the global UAV market accounted for USD 14 billion (Drone Industry Insights, 2020). As the UAVs are classified as double-use items, the trade in them is subject to specific trade regulations concerning export as well as import regimes, e.g. the Missile Technology Control Regime (1987) as a multilateral export control platform for *inter alia* UAVs carrying missiles and those capable of delivering weapons of mass destruction (SIPRI, 2019, pp. 522).

To date, the UAVs are employed in a wide range of military (intelligence, surveillance, and combat operations), civil (recreational flying of toy and model drones etc.), commercial (e.g. delivery drones), and R&D applications. The demand for their prospective utilization in new areas such as air taxi, delivery of goods, and package delivery has raised airspace safety, privacy security, and personal data processing concerns. As a result, at the EU level, new common rules on drones were set and will enter into force on July 1, 2020. Basically, so far, each EU member state has operated its own national regulatory framework. The new

EU common rules are expected to simplify the regulation and contribute to the expansion of UAVs while ensuring the air traffic safety.

Parallelly, with the development of EU legislative framework, the European Commission has launched the European Network of U-space Demonstrators in October 2018, which included 10 large-scale demonstration projects. Out of CEE countries, only Hungary actively participates in the project, not taking into account that a Romanian state-owned company is among the subjects involved in the demonstration in Greece (European Investment Bank, 2019). At the same time, important milestones were crossed in the U.S., which is the world leader in UAV production and trade. Under the Integration Pilot Program (IPP), breakthrough projects were launched in 2019, where formerly restricted activities were approved under the surveillance of the Federal Aviation Administration (FAA, 2019). The results of UAVs resent tests according to Ganesh (Yahoo Finance, 2019) might have an impact on the future legislation draw-up.

Based on the recent development of UAVs international trade, our research question is: *Is the economic environment ready for a stronger proliferation of UAVs into commercial operations?*

The literature review part concerns the definition of UAVs, state of research in the field of trade in the UAVs and the development of data sources. Quantitative, descriptive approach is then used to evaluate the trade with the UAVs and estimate the potential development of the aforesaid trade. In this part of the analysis, existing trade barriers are considered as well. We conclude with merging the research outcomes, stating research limitations and suggesting the topics for future research.

1. Literature Review

1.1 Defining UAVs

The terminology related to UAVs is far from being consistent. An extensive overview of related terminology and definition of various types of UAVs has been presented in Černá (2016). In addition to the established terminology, let us point out that the contemporary European Union's (EU) and European Union Aviation Safety Agency's (EASA) documents use the term unmanned aircraft systems (UAS). In our paper, we use the terms listed hereinafter: UAV (unmanned aerial vehicle), drone (here: synonym to UAV, can be used interchangeably), RPAS (remotely piloted aircraft system, in fact the UAV that is not pre-programmed), and UCAV (unmanned combat aerial vehicle, either loaded or unloaded, here: synonym to armed drones).

According to their parameters, we can distinguish among many UAV categories (UVS info, 2018, pp. 122). There are different classifications of UAVs, depending on the area dealing with them. The legislative approach takes into account mainly the type of operations performed and the weight, while the technical one classifies them according to performance parameters and airframe type. On the contrary, for customs procedure formalities, it is basically indispensable to take into consideration the unladen weight, (non) presence of camera, and field of application (military, civil).

For the purposes of this paper, we mention the relevant technical categories (currently flying), which we re-grouped into a handful of joint categories (Tab. 1), each of them offering different application properties that determine whether the given UAV is subject

to lesser or stricter rules in terms of airspace safety. We discuss this later on in the part dedicated to three UAV categories within the upcoming new EU rules on drones. The small-scale UAVs function mainly as toy drones, for model flying and recreational purposes, whereas the UAVs with higher weight, longer endurance, wider flying range, and higher flight altitude serve for professional or military operations. Indeed, not all military-used RPAS belong to UCAV category, for the latter is defined by four technical parameters that are to be fulfilled. For instance, Cantas models produced in the Czech Republic belong to SR or MR, depending on equipment and properties. They can perform both military and civil missions on the remotely-piloted or pre-programmed basis (New Space Technologies, 2020) and (UVS-info, 2018, pp. 128).

Tab. 1: Key RPAS joint categories according to performance parameters

	Flying range [km]	Flight altitude [m]	Endurance [hours]	MTOW [kg]*)
Nano+Micro+Mini	up to 10	up to 150	up to 2	up to 25
Close and Short Range (CR+SR)	10-70	3.000	2-6	150-200
Medium Range/Medium Range Endurance (MR+MRE)	> 70	5.000-8.000	6-18	1.250
Low Altitude Deep Penetration (LADP)	> 250	50-9.000	0.5-1	350
Low/Medium Altitude Long Endurance (LALE+MALE)	> 500	3.000-14.000	> 24	< 1.500
High Altitude Long Endurance (HALE)	> 2.000	20.000	24-48	12.000
Unmanned Combat Aerial Vehicle (UCAV)	ca. 1.500	10.000	ca. 2	10.000

Source: (UVS info, 2018, pp. 122), own elaboration.
*) MTOW – maximum take-off weight

In terms of customs procedures, following the WCO discussion, the UAVs can fall under six different HS codes, which can considerably affect the applied import tariff rate and the (non)obligation to comply with double-use items trade regulations. Namely, simple toy drones and such belong to HS 950300 *Tricycles, …reduced-size ("scale") models and similar recreational models* etc. Complex professional drones without camera for both civil or military use fall under HS 880211 *Helicopters of an unladen weight not exceeding 2000 kg*, HS 880212 *Helicopters of an unladen weight exceeding 2000 kg*, HS 880220 *Aeroplanes and other aircraft, of an unladen weight not exceeding 2 000 kg* or HS 880230 *Aeroplanes and other aircraft, of an unladen weight exceeding 2000 kg but not exceeding 15000 kg*. The UAVs with camera are classified under HS heading 852580 *Television cameras, digital cameras and video camera recorders* (European Commission, 2016, pp. 5) and (European Commission, 2013).

In fact, there are hypothetically also HS 880240 *Aeroplanes and other aircraft, of an unladen weight exceeding 15000 kg* and HS 880260 *Space craft (including satellites) and suborbital and spacecraft launch vehicles* – they may apply to (exo-)stratospheric and space UAVs, whose parameters are to be determined. Currently, none of them is flying (UVS-info, 2018, pp. 122).

1.2 Drone Regulation

Besides the availability of UAVs, there are other factors with a positive or negative impact on the expansion of UAVs into commercial activities. Lotz (2015) points at legal, financial, flight limitations, and customer expectations areas of concern. The SESAR European Agency (2016) names legislation, social concerns, and market development. This paper focuses on legislative and market development factors. The progress in technologies is followed by the development of legislation. The revolutionary changes in terms of new legislation will take place in the EU in 2020 with full implementation of UAV regulatory rules and procedures applied to their operations, imposed by the Commission Implementation Regulation (EU) 2019/947 of 24 May 2019 from 2022 onwards (European Commission, 2019). The new EU regulation divides the operations into three categories: 'open, specific, and certified' and provides two standard scenarios of operations for the 'specific' category.

For further employment of UAVs in logistics and carriage of goods, the most relevant category of operations in the one called 'specific', which is regarded as involving higher risks than the open category. The main difference between 'open' and 'specific' category is the limit for maximum take-off weight exceeding 25 kg in case of 'specific' category, including operations beyond visual line of sight (BVLOS) and enabling package delivery by drone. In the U.S., this category of operation is regulated under 14 CFR Part 135. All certified UAVs have to be registered and all operations in the 'specific' category have to be authorised by the National Aviation Authority. A risk assessment has to be performed including the mitigating measures (European Commission, 2019).

As far as the EU is concerned, the contemporary use of UAVs under the said category involves the governmental operations, industrial use (mining, energy), agriculture, entertainment, media, and logistics (SESAR, 2016). In the U.S., the non-model UAVs are mostly used in research and training missions (21%), followed by entertainment (21%), industrial and environmental projects (16%), real estate and construction (13%), agriculture (7%), and press and media (5%) (FAA Aerospace Forecasts, 2019). The potential shipments for drone deliveries could be mail, medical samples and drugs, or food. Parcel deliveries in the EU are tested in Rieti, Italy, or between two cities Helsinki and Tallinn (SESAR, 2018).

Examples of commercial operations can be already provided. In the U.S., within the specific logistics operations, UPS was granted a Standard operator certificate under Part 135, whose holder operates with no limits on the size or scope of operations. "*However, the operator must be granted authorization for each type of operation they want to conduct*" (FAA, 2019). UPS Flight Forward's certificate "*permits the company to fly an unlimited number of drones with an unlimited number of remote operators in command*". The deliveries take place in hospital and medical campuses, including BVLOS and night operations (UPS Pressroom, 2019).

2. Methodology

2.1 UAV Market and Market Data

Relevant books and journal articles focusing on UAVs have widely discussed their design, guidance control, drone defence, security, and regulation, yet just very little has been written in economic literature about international trade in UAVs. In fact, relevant papers are orientated just towards arms trade in general and arms trade treaty. Černá (2016) is the sole paper we found, providing an insight into the international trade issues.

As for the statistical data, SIPRI (2020a) offers official statistics covering exclusively the transfers of specific UAVs for military purposes (UCAVs), and UVS Info in its RPAS Yearbooks The Global Perspective provides data sets on production and development of RPAS only. The data on world trade in all types of UAVs, not just UCAV reported by SIPRI (2020a), are to date unavailable, even though some sources, such as The Guardian (2015) or Statista (2020) misinterpret their source and report data for all UAVs trade, yet SIPRI as their information source tracks only the UCAV trade.

More complex factsheets on national UAV markets and in-depth analysis of national drone regulatory frameworks can be found in (Drone Industry Insights, 2019) that is to date the leading source regarding commercial drones, yet the amount of licence fee makes it out of reach of regular researchers and turns it into an information source exclusively for companies on respective markets, making strategic business decisions.

The commonly accessible trade statistics databases ran by WTO, EU, and national statistical offices are in fact of no use, since the UAVs represent a very narrow segment that is fragmented into six rather narrow HS codes that, however, apart from UAVs involve also other devices, e.g. Czech Statistical Office (2020). Within European Council (2009), they belong to the Category 9 *Aerospace and Propulsion* and, more precisely, to the subcategory 9A012 *Unmanned aerial vehicles (UAVs), associated systems, equipment and components*. Theoretically, additional information on exports and imports of UAVs could be found in national reports on arms exports in SIPRI (2020b), but specific information on export/import licences, detailing the goods, number of items and financial value are hard to find. For instance, the national report of the Czech Republic for the year 2017 indicates that the UAVs belonged to the military material group No. 10 including *Aircraft, lighter-than-air vehicles, unmanned airborne vehicles, aero-engines and aircraft equipment, related equipment and components, specially designed or modified for military use*. Specific information on trade is then available for the whole group No. 10, thus it is impossible to get data related to UAVs only.

There is an obvious shortage of up-to-date statistical data concerning RPAS production, since in the latest issue of RPAS Yearbook (UVS-info, 2018), the latest data are for 2017.

3. Results and Discussion

3.1 Production, Development, and International Trade

The number of referenced RPAS more than doubled over the last decade, yet in recent years, the dynamics stagnated or even decreased, Tab. 2. The indicated total numbers do not equal total numbers of RPAS produced/developed, for some of the referenced RPAS were no longer in production/development in the respective years.

Tab. 2: Total quantity of RPAS models referenced over 2005-2017

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total referenced	544	603	789	974	1.119	1.244	1.424	1.581	1.708	1.884	2.115	2.020	1.970
Index (2005 = 100)	100	111	145	179	206	229	262	291	314	346	389	371	362

Source: (UVS-info, 2016, pp. 148), (UVS-info, 2018, pp. 124, own calculations and elaboration.

The share of RPAS for military applications (UCAVs and other) that represented more than one third of all RPAS models, shrank, while nearly 25% belonged to dual-purpose vehicles that could be multi-mission, meaning that they could be employed as surveillance, search-and-destroy, decoy as well as kamikaze (self-destruction) vehicles; Tab. 3. Again, the reported figures do not match precisely the total numbers of RPAS produced/developed in respective years. In this case, as the figures are lower, we assume that it is due to information shortage or lack of complete dataset provided by all producers/developers.

The strongest growth is observed in the area of civil or commercial UAVs, whose application consists in model or toy drones flying, as well as commercial applications, such as remote sensing, precision agriculture, fire-fighting etc. or even recently, also package deliveries.

Tab. 3: RPAS referenced per class (number, n=1742 and 1924 respectively)

	Civil or commercial	Military	Dual purpose	Research and developmental
2014	418	600	502	222
2017	739	543	539	103

Source: (UVS-info, 2015, pp. 159), and (UVS-info, 2018, pp. 125) own elaboration.

In 2017 globally, 1.970 models of RPAS were allegedly produced, out of which more than one third was represented by mini drones (i.e. less than 25 kg in weight). Number of UCAV models even dropped over the years, while HALE and LADP stagnated; Tab. 4. UVS-info (2018) states a new category (Passenger transport) yet without indicating its parameters. On the contrary, the Nano+micro+mini group rocketed – nano drones showed annually a stable number of models ranging between 13 and 20, while mini UAVs were dominant with micro ones ranking the second in this group. The number of micro UAVs models more than doubled over the time, which was the highest growth dynamics among RPAS categories. Data concerning 2016 are unavailable – the yearbook was not published in that year. The UCAV market is rather small – in 2017, there were 12 model produced/developed in the U.S., five in China, three in Russian Federation, two in the UK, one in Germany, one in India and one within the Airbus consortium.

Tab. 4: Selected joint categories of RPAS produced or developed

	2011	2012	2013	2014	2015	2016	2017
Nano+Micro+Mini	674	728	845	1.015	1 205	-	1.235
CR+SR	343	350	369	393	399	-	318
MR+MRE	229	231	237	241	258	-	217
LADP	5	4	4	4	4	-	5
LALE+MALE	60	73	86	83	86	-	92
HALE	33	34	36	36	37	-	31
UCAV	27	27	27	27	27	-	25
Passenger transport	-	-	-	-	-	-	42
Other	7	6	7	7	7	-	5
Total	1.378	1.453	1.611	1.806	2.023	-	1.970

Source: (UVS-info, 2012, pp. 152), (UVS-info, 2013, pp. 167), (UVS-info, 2014, pp. 151), (UVS-info, 2015, pp. 155), (UVS-info, 2016, pp. 146), (UVS-info, 2018, pp. 123), own calculations and elaboration.

The RPAS production is led by the U.S., China, France, Israel, and Russian Federation, yet in comparison to 2014, in 2017 the strongly dominant position of the U.S. was weakened by a steep production growth in China; Tab. 5. By the same token, the UK, Spain and Australia lost some of their grounds, while Japan, Poland, Norway, and the Czech Republic expanded their model portfolios. The latter occupied 26th position with 19 models (micro, mini, SR, and MR).

Tab. 5: RPAS production and development (all categories, number of models) in 2017

	2014	2017		2014	2017		2014	2017
US	419	374	**Spain**	52	41	**Ukraine**	20	25
China	174	311	**Pakistan**	41	38	**Turkey**	19	25
France	117	116	**Japan**	14	34	**Australia**	35	23
Israel	111	115	**Canada**	30	33	**Taiwan**	22	22
RF	93	98	**South Korea**	30	33	**Indonesia**	6	20
Germany	79	77	**Switzerland**	31	32	**Norway**	11	19
UK	72	65	**Poland**	15	32	**South Africa**	15	19
Italy	57	55	**Brazil**	26	32	**Czech Republic**	10	19
Iran	44	43	**India**	18	26	**Other**	241	243
						Total	**1.802**	**1.970**

Source: (UVS-info, 2018, pp. 123), own elaboration.

The contemporary main suppliers of UCAVs are the U.S., China, and Israel, which altogether represent nearly 95% of all devices sold, leased or licensed over 2015-2018; Fig. 1. The remaining five countries hold negligible stakes. Figures indicate a higher market concentration, for the UCAVs are nowadays produced in a fewer countries than they used to be in the last decades (SIPRI, 2020a). Main recipient/licenser countries are Afghanistan, the UK, and United Arab Emirates, closely followed by Pakistan and Saudi Arabia. The Czech Republic purchased ten items. The *unknown* involves deals, where only the region was indicated.

China's position on the UCAV market was strengthened by a steep improvement in military technology and wider portfolio of recipient countries that used to be dominated by Asian and European ones. Yet the majority of UCAVs deliveries headed for recipient countries in the Middle East, where the U.S. as its major competitor was reluctant to sell (SIPRI, 2019, pp. 244). China expanded its share in number of UCAVs delivered at the expanse of Israel that used to be No. 1 world supplier. As an answer, to strengthen the US position *vis-à-vis* specifically the Chinese competing producers, the Trump administration relaxed the rules on the export of UAVs in the beginning of 2018 in order to cut the red tape and boost the U.S. competitiveness on the world aerospace market (SIPRI, 2019, pp. 237).

Fig. 1: Transfers of UCAVs over 2015 – 2018 (% in number of UAVs sold, leased, licensed, n=438; deals concluded yet with postponed delivery from 2019 onwards excluded)

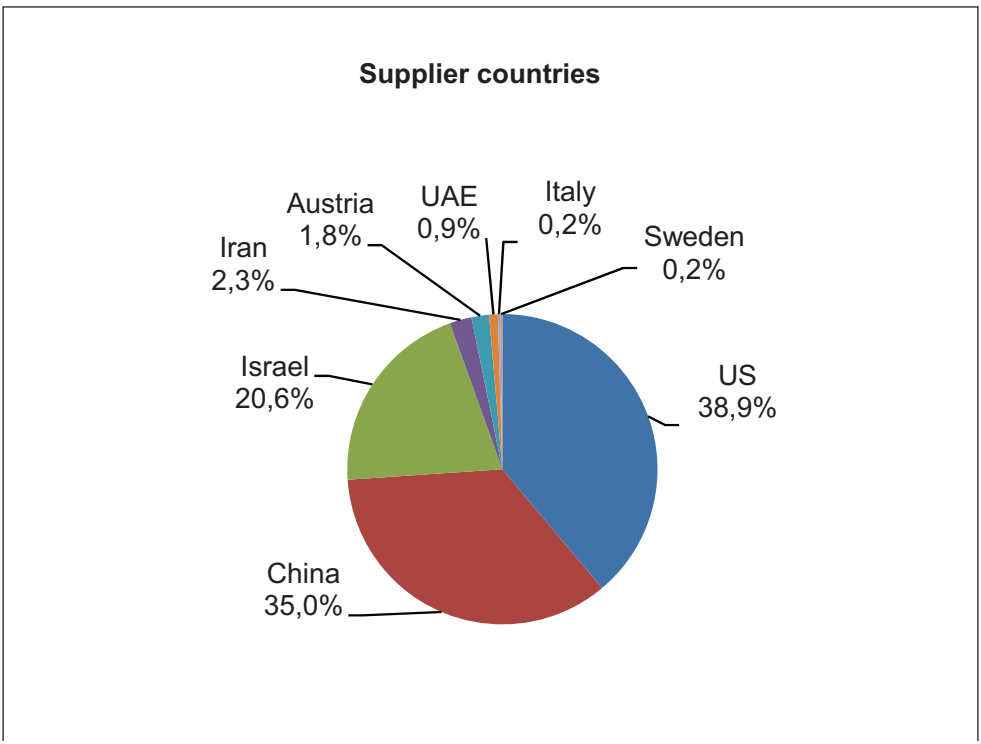
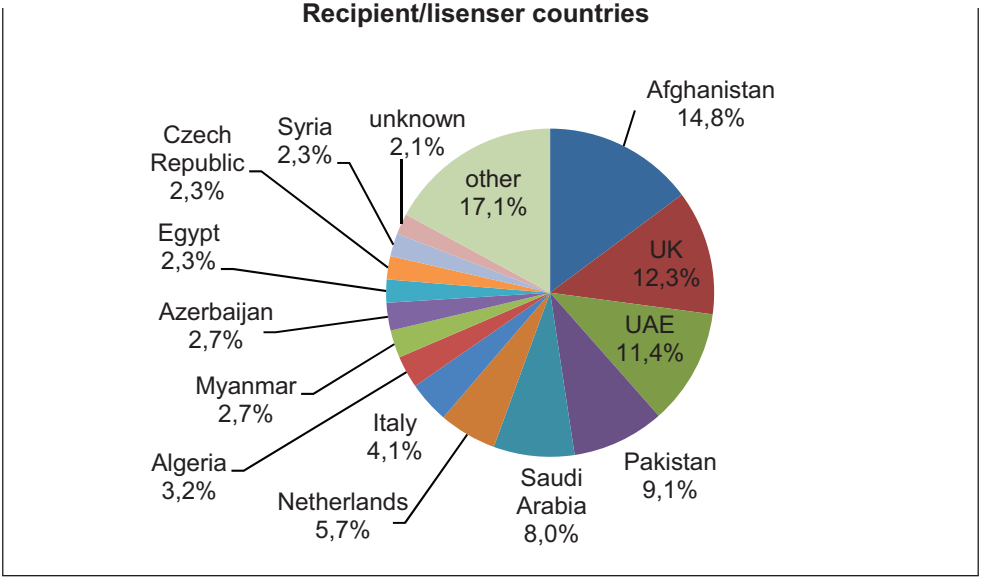


Fig. 1: Continuation



Source: (SIPRI, 2020a), own calculations and elaboration.

Tab. 6 indicates the applied MFN import duty rates for six relevant HS headings in key producer and export/import countries. The UAVs under all referenced subheadings of HS 8802 are listed as double-use items, thus respective trade export and import regulations implementing internationally agreed dual-use controls, non-proliferation agreements, international embargoes and trade sanctions etc. apply. This particularly applies to the cases of Iran and Russian Federation. Given the existence of the EU common customs tariff and the EU-Turkey customs union, the MFN import duties of EU and Turkey are in fact identical. All countries apply ad valorem duties except for Switzerland that utilizes specific duties. The developed economies such as the U.S., UK, Israel, Japan, and Canada are liberal in all six HS headings and apply low or even zero import duty rates. The EU stays rather protectionist in case of UCAVs, while South Korea in the case of toy drones.

Indeed, the liberal or protectionist stance highly depends on each state's position in production, export, and import as well as a competitive (dis)advantage of its own production, if any. The level of country's economic development may play a decent role as well. It is obvious that main importers tend to have non-zero import duty rates, while the top exporters have 0% or just low duty rates. An interesting situation can be seen in Russian Federation, which ranked among five major RPAS producers/developers in both 2014 and 2017, but its involvement in the UAV foreign trade stays marginal and subject to a rather protectionist trade regime. It reportedly did not export UCAVs at all, nor did it act as their receiver/licenser over the observed period of time. The question is to what extent this situation stems from the trade sanctions the EU, the U.S., and other states imposed in 2014 as a reaction to the annexation of Crimea by Russia and the counter-sanctions the latter subsequently imposed. Quite similar situation can be seen in the case of Iran, Pakistan, India, Afghanistan, Algeria, and Myanmar, which could arise from to their comparative disadvantage in the UAV production.

Tab. 6: Applied MFN duty rates for UAVs in 2020

	Position	HS 880211 (or 880212*)	HS 880220	HS 880230	HS 950300**	HS 852580***
USA	P, X	0%	0%	0%	0%	0%
China	P, X	2%	5%	4%	0%	0%, 3.3%, 4%, 10%, 11% or 11.7%
EU	P, X, M	civil 0%, other 7.5% (or 2.7%)	civil 0% other 7.7%	civil 0% other 2.7%	0%	0%
Israel	P, X	0%	0%	0%	0%	0%
RF	P	civil 10%, other 15% (or 12.5%)	civil 10% other 15%	8%	7.5% or 10%	0%, 3% or 5%
UK**	P, M	0%	0%	0%	0%	0%
Iran	P, X	15%	15%	5%	10% or 26%	5% or 10%
Pakistan	P, M	3%	3%	3%	3% or 20%	11%
Japan	P,	0%	0%	0%	0%	0%
Canada	P	0%	0%	0%	0%	0%
South Korea	P	0%	0%	0%	8%	0%
Switzerland	P	71 CHF/100 gross kg	70 CHF/100 gross kg	62 CHF/100 gross kg	41 CHF/100 gross kg	0%
Brazil	P	0%	0%	0%	35%	0% or 20%
India	P	2.5%	2.5%	2.5%	20%	10% or 20%
Turkey	P	7.5% and 2.7%	7.7%	2.7%	0 or 4.7%%	0%, 3%, 4.9% or 14%
Ukraine	P	0%	0%	0%	0%	0% or 10%
UAE	X, M	0%	0%	0%	5%	0%
Afghanistan	M	0%	0%	0%	20%	10%
SA	M	0%	0%	0%	5%	0%
Algeria	M	0%	0%	0%	30%	15% or 30%
Myanmar	M	3%	3%	3%	3%	15%

Source: (European Commission, 2020a), (European Commission, 2020b), own elaboration.
Legend: 'Position' designates whether the country belonged to major twenty RPAS producers (P) in 2017, UCAV exporters/licensers (X) or top 9 importers (M) over 2014-2017.

*) Iran and China have special categories *Helicopters unmanned* under HS 88021110.

**) In Iran, 10% if max. range of 100 m and max. endurance of 5 min, other: 26%.

***) The rates depend on camera type, material used and number of camera tubes. UAE, China, Israel and Saudi Arabia use specific codes for UAV, e.g. *Radio-controlled reduced-size models of aircraft* or *Toy UAV*, mostly under heading HS 95030040.

****) "*…the information published on this page related to UK temporary tariffs, procedures and formalities will not apply before 1 February 2020 at 00.00 (CET).*" (European Commission, 2020a). For further information see (UK Government, 2020).

Conclusion

Given the data on trade and production, the UAV market seems to move to a more mature stage, which is reflected in the stagnation of both, the number of models produced/developed and the number of producers/developers. Accordingly, the U.S. and the EU, as main producers and traders, increasingly incorporate the UAVs into their legislations on airspace operations. This is expected to give an additional impetus to the UAV proliferation into a wider range of commercial activities, such as delivery drones that are already operated in the U.S. The mini drones of the weight not exceeding 25 kg, embraced in the EU 'open' category, constitute the subgroup with the highest growth rate in terms of number of produced/developed UAVs.

As the UAVs to date belong to six different HS codes (yet not exclusive to drones), the available international trade datasets concerning specifically UAVs only are inexistent or very hard to access, which makes it extremely difficult to track the trade in them. The UCAV market is rather specific and narrow (yet representing the only UAV subgroup with solid and reliable trade data). It is rather stable, with the supplier countries portfolio limited to a handful of states – the U.S., China, selected EU member states and Middle Eastern countries, out of which some sell the second-hand vehicles not produced in their territories.

The trade policy stance, expressed by the applied MFN duty rates for six relevant HS codes, goes hand-in-hand with the country's position in UAV exports, imports, and production. The production is dominated by the U.S., China, France, and Israel, while the trade in UCAVs only is performed primarily by the U.S., China, and Israel, who impose zero or low MFN rates.

The proliferation of UAVs into commercial deliveries will be most likely accompanied with problems arising from physical danger the drones can pose and from privacy protection. Among other, there are two aspects that may be critical in the acceptance of UAVs by public. First, the jurisdiction in the field of UAVs operations is missing (Verlag Dashöfer, 2020). The implementation of regulative norm on the EU level can ease the vide implementation of UAVs for commercial purposes in the EU countries, on the other hand, the regulation encompasses just part of the rising issues and needs to be complemented by national legislations. Second, the necessary tests preceding the implementation in commercial space are limited in terms of territories and operations. So far, no testing for commercial purposes under SESAR in the region of Central and Eastern Europe has been implemented except for Hungary. The newly implemented EU legislation approaches the U.S. legislation more than the previously implemented national legislation norms. A similar UAV-related legal environment can support the international use of test results and speed up the international implementation of commercial operations. National agencies (FAA Aerospace Forecasts, 2019) and (SESAR, 2016) predict a fast growth of commercial drone market. Besides other, questions remain regarding the implementation and development of regulation. The position of EU on the future UAVs market is also questionable – will the EU producers rank among the world leading producers or will they strengthen their position e.g. in value adding hardware, software and design?

The follow-up work can be aimed at deeper insight into national regulatory frameworks for UAVs operations in major importing countries, prospective markets with immense market potential (e.g. India) and assessment of the common EU rules contribution to the integration of civil UAV aviation into the EU airspace system. The focus of this research consisted in the regulations and international market development; the social concern has not been included. Further research can be conducted in the field of acceptance of the drone delivery services by potential customers in different areas and countries.

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