A JURIDICAL AND STATISTICAL ANALYSIS ON THE DRONE EMERGING MARKET: A PHENOMENON REQUIRING ADEQUATE RULES AND MANAGEMENT

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1. – Drones', which is the most popular term for unmanned aerial vehicles (UAVs), are basically unpiloted aircraft, initially developed in the military setting and used mainly for military purposes (in particular, for so-called '3D missions', namely missions classified as 'Dull, Dangerous, or Dirty'). In other words, the use of such aircraft in the military field is suggested wherever onboard human presence is not recommended for various

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reasons, such as length of the flight or jeopardy to a pilot's safety [1].

Later, the experience gained in military operations led to civilian tests of UAVs in many roles. Thus, drone technology transitioned into the civilian business sphere, where it is bringing about a real revolution. From this point of view, all relevant process elements linked to production and use of drones, especially in the civil field, belong to that group of inventions commonly considered and defined as 'disruptive' due to their widespread use within whole sectors of the economy. Specifically, this is an era of continual disruption in which technological innovation and business model changes are affecting entire industries and ecosystems [2].

The success of drones is mainly due to the utility of such devices in carrying out tasks previously achieved by 'traditional' aircraft. In particular, the use of drones reduces operating costs. Moreover, remote piloting (*recte*, remotely piloted aircrafts systems – RPAS) appears to offer improved performance. For example, drones can be flown into high-up or hazardous areas and have a great versatility of flight – they can also enter narrow and confined spaces – together with a marked ability to approach targets more closely and provide imagery that cannot be seen by the human eye.

Today, drones are used in both business and day-to-day life in a large range of civil applications, which cannot all be specified here. In particular, they are widely used in the industrial sector, e.g., for infrastructure monitoring and pipeline and energy inspection. They have similar uses in ship operations and logistics. Although leading actors such as Amazon and DHL are experimenting with this technology to ship their packages from the warehouse directly to the customer, drone operation has already become a standard in the maritime industry. There, infrastructure inspection by drones contributes to safety improvement, cost reduction, and acceleration of processes. In fact, a remotely piloted aircraft system (RPAS) can replace human inspection in routine maintenance and monitoring because it can safely go where humans cannot. Thus, the structural integrity of vessels, offshore platforms, and loaded cargoes can be easily monitored re-

[1] See Bruno Franchi, *Aeromobili senza pilota (UAV): inquadramento giuridico e profili di responsabilità – I parte*, *Resp. civ. prev.*, n. 4, 2010, 733; S. Kaiser, *UAVs and Their Integration into Non-segregate Airspace*, *Air & Space Law,* 36*,* 2011, 161-172.

[2] On this subject, A. Kumaraswamy, R. Garud R. & S. Ansari, *Perspectives on Disruptive Innovations*, *Journal of Management Studies*, v. 55, Issue 7, 2018, 1025-1042.

motely and in real time. Further, RPASs are also commonly used in natural disaster mapping activities and rescue operations. Within the broad range of security and surveillance activities, unmanned aircraft systems provide the ideal solution to a series of challenges and limitations faced by traditional surveillance methods. For example, drones can be used in police-related road traffic missions, coverage of demonstrations and large public events, fisheries protection, pipelines and power line surveillance, maritime pollution monitoring, border patrol operations, drug trafficking and poaching prevention.

Besides, they can provide valuable assistance in precision agriculture, where these devices monitor fields, take more detailed pictures (3-D maps) in every phase of the crop cycle, and intervene in cases where human health and the environment are exposed to risk. A similar use of drones is common in research and environmental protection organizations (e.g., in wildlife monitoring programs and in atmospheric and oceanic research). The adoption of aerial surveys has grown also in geology, where there is a widespread use of drone imagery and photogrammetry to map basins, mines, caves, roads, and so on. Likewise, in architecture and civil engineering, drones with high-definition cameras, infrared scanners, and thermal sensors allow for gathering important data right from the design phase. They can survey sites, inspect construction quality, and photograph completed buildings. Another interesting (and well-known) field in which aerial footage is widely used is the media and entertainment sector. Here too, the main reason why aerial footage by drones is successful lies in their versatility and angle of approach to the target. The use of RPASs in tourism marketing and cultural heritage promotion deserves special mention because aerial drone footage is now a useful and effective tool (an alternative to the traditional catalogue) for promoting a destination or a tourist accommodation.

Finally, in this era of social networks, drones are used for recreational purposes by amateur filmmakers and hobbyists, with a corresponding market share.

Basically, the aforementioned uses of drones are in line with the results of the statistical survey carried out by the authors and illustrated in the second part of this article. Previous surveys have been made in this sector

(e.g., in Italy, by Doxa 2015-2016), but the present investigation has the advantage of being the most recent, having twice as many respondents, and posing more detailed questions. Nevertheless, there is a need for further surveys with a view to extending to the demand segment what has so far been investigated in the supply segment.

2. – Law is commonly considered a social construct to help a society hold together and give rules for productive coexistence with respect for human rights (including protection of personal privacy) and for safety and security principles. From a legal point of view, a necessary precondition for individuating a framework governing drone activities is a shared terminology (legal qualification) for such devices. The terminology issue is not purely formal. Although the way drones are named may seem of little relevance, an improper use of terms may affect regulation by causing legal gaps or excessive complexity [3]. Thus, harmonization of terms is a goal. Accordingly, the European Aviation Safety Agency (EASA) in its document *Concept of Operations for Drones* (2015), states that '*terms coming from the ICAO circular 328-AN/190* [UAS and RPAS] *are replaced in the common language by the word "drone" and this document will accordingly use drones to speak of UAS and RPAS*' [4]. At present, however, the legal terminology is still not harmonized, although there is a clear view in the normative sector on who is competent to regulate this activity.

As mentioned in the introduction, these devices have over time been called in different ways: drone, model aircraft, pilotless aircraft, autonomous aircraft (AA), remotely operated vehicle (ROV), pilotless aerial vehicle (PAV), unmanned vehicle (UV), remotely piloted vehicle (RPV), pilotless aerial vehicle (PAV), unmanned aircraft (UA), unmanned aerial vehicle (UAV), and remotely piloted aircraft (RPA). The names eventually used are unmanned aircraft system (UAS) and remotely piloted aircraft system (RPAS), which are also the two most common in addition to drone and UAV [5].

[3] See, M. Huttunen, *Unmanned, remotely Piloted or Something Else? Analysing the Terminological Dogfight*, *Air & Space Law*, 42, n. 3, 2017, 349-368; S. Panzeri, *I sistemi aeromobili a pilotaggio remoto (SAPR): profili giuridici*, in this *Rivista*, Vol. XIV, 2016, p. 4.

[4] See, 2. Background.

[5] In the below mentioned EASA document titled *Concept of Operations for Drones*, RPAS is

At the European Union (EU) level [6], a UAV is considered to be '*an aircraft which is designed to operate with no human pilot on board*', while ICAO circular 328-AN/190 defines a UAS as '*an aircraft and its associated elements which are operated with no pilot on board*'. Under the same ICAO normative, an RPAS is '*a set of configurable elements consisting of a remotely-piloted aircraft, its associated remote pilot station(s), the required command and control links and any other system elements as may be required, at any point during flight operation*'.

In the face of such complexity, long debates and multilevel initiatives have been promoted with a view to establishing a shared legal terminology [7].

Under International, European, and Italian legislation (and with the specifications and exceptions mentioned below in this article), as a starting point to identify the relevant legal framework, drones are treated as equivalent to aircraft; consequently, they are subject to the legal provisions of the aviation sector. In short, they have to comply with aviation safety rules.

3. – At the international (uniform law) level, first steps toward regulation were established in Article 8, 'Pilotless aircraft', of the Convention on International Civil Aviation (also known as the Chicago Convention),

considered 'a sub-set of UAS'.

[6] See, for instance, the JAA-EUROCONTROL study titled *UAV Task-Force Final Report*, 2004.

[7] For more extended analysis of this issue in Italian Law Doctrine, see esp. C. Severoni, *La disciplina normativa attuale degli aeromobili a pilotaggio remoto – The Current Legal Framework of the Remotely Piloted Aircrafts*, *Diritto dei Trasporti*, 1, 2016, 65-103; E. Rosafio, *Considerazioni sui Mezzi Aerei a Pilotaggio Remoto e sul Regolamento ENAC – Considerations on Remotely Piloted Aerial Vehicles and on ENAC Regulation*, *Rivista del Diritto della Navigazione*, 2, 2014, A. Sia, *Profili attuali della disciplina giuridica dei mezzi aerei a pilotaggio remoto e il regolamento dell'Ente Nazionale dell'Aviazione Civile italiana (ENAC)*, *Diritto dei Trasporti*, 2014, 743-774; La Torre, U., *La navigazione degli UAV: un'occasione di riflessione sull'art. 965 c.nav. in tema di danni a terzi sulla superficie*, *Rivista del Diritto della navigazione*, 2012, 553-575; B. Franchi, *Aeromobili senza pilota (UAV): Inquadramento giuridico e profili di responsabilità – I parte*, *Responsabilità civile e previdenza*, 4, 2010, 733-751; B. Franchi, *Aeromobili senza pilota (UAV): Inquadramento giuridico e profili di responsabilità – II parte*, *Responsabilità civile e previdenza*, 6, 2010, 1213-1232; A. Masutti, *Proposals for the Regulation of Unmanned Air Vehicle Use in Common Airspace*, *Air & Space Law*, v. 34, Issue 1, 2009, 1-12.

signed in 1944: '*No aircraft capable of being flown without a pilot shall be flown over the territory of a contracting State without a special authorization by that State and in accordance with the terms of such authorization. Each contracting State undertakes to insure that the flight of such aircraft without a pilot in regions open to civil aircraft shall be so controlled as to obviate danger to civil aircraft.*' Having set out this basic discipline for pilotless aircraft, the document implicitly leaves it to the States Parties to draw up *ad hoc* norms. The rule quoted above, because it was established in a period of inadequate technological development and consequent lack of interest in such devices, remained unapplied for many years. In recent times, as drones have gone from being only a military tool and have moved into the mainstream of civil applications, entrepreneurs started finding ways to exploit the technology and explore new business opportunities. Consequently, a clear need arose to provide a firm legal basis for the management of drones. Thus, since the early 2000s, working and consulting groups involving experts, operators, and stakeholders have been convened at the international and regional levels to start a new and more efficient legislative process in this field. At the international level, for instance, the Unmanned Aircraft Systems Study Group (UASSG) of the International Civil Aviation Organization (ICAO) started its sessions in April 2007. The EASA, among others, supports the UASSG.

In parallel with consulting activity, the ICAO started emending some technical annexes (namely Nos. 2, 7, and 13) necessary to accommodate RPAS/UAS requirements.

In this context, ICAO Circular 328/AN/190 is particularly significant in regard to the UAS legal basis at the international level. While 'annexes' are legally binding, 'circulars' have informational and proactive value.

Circular 328/AN/290 was adopted in March 2011 with a view to *'a) apprise States of the emerging ICAO perspective on the integration of UAS into non–segregated airspaces and aerodromes; b) consider the fundamental differences from manned aviation that such integration will involve and c) encourage States to help with the development of ICAO policy*' [8] .The aim of this circular is to achieve (2.8) and maintain '*the highest possible uniform level of safety*' (including the '*safety of any other airspace users as well as the*

[8] Circular 328/AN/290,1.6.

safety of persons and property on the ground'). Paragraph 2.10 of the circular also clearly states that development of a complete regulatory framework for drones '*will be a lengthy effort, lasting many years*' and involving many aspects (not only technical specifications and standards development, but also harmonization of terms and definitions needed to support the drone activity).

The efforts made under the auspices of the ICAO demonstrate the ongoing commitment and determination to exchange research and lessons learned, encourage the spread of good practices, and foster the emergence of a comprehensive and harmonized regulatory framework to support UAS activities. For instance, the Third Remotely Piloted Aircraft System Symposium (RPAS/3) took place on 10-12 September 2018 in China. These symposia are opportunities at the global level for networking, coordination, and collaboration between civil aviation authorities, industry, and stakeholders from industry, academia, governments, and international organizations in the aviation sector. The 2018 session devoted particular attention to the complex issue of transition from segregation to integration and, notably, to UAS traffic management (UTM), in order to integrate drones into the global aviation system.

4. – This section discusses the most relevant steps towards a European set of rules on drones.

a) Institutional initiatives.

Besides the activities of the ICAO, other initiatives to develop recommendations for a single set of technical, safety, and operational requirements for drones are ongoing at the regional level. Several States are collaborating within the Joint Authorities for Rulemaking on Unmanned Systems (JARUS), chaired by the EASA. At the EU level, although the European Commission has supported RPAS development since the end of the 1990s, only after the 2000s did all key players start being more active. Working and study groups have been convened within the EU institutions and aviation authorities to address a legislative process on RPAs. For example, it is worthwhile to note the joint initiative called 'A concept for European Regulations for Civil Unmanned Aerial Vehicles (UAVs)'. That

initiative was promoted by the UAV Task-Force in its final report, jointly published on 11 May 2004 by the Joint Aviation Authorities (JAA) and the European Organization for the Safety of Air Navigation (EUROCONTROL). The UAV Task-Force has been meeting since September 2002 and has involved representatives of the European aerospace industry, State civil aviation authorities, and other authorities, such as the North Atlantic Treaty Organization (NATO), that have a direct interest in drones. In the final report it is underlined that all efforts are aimed at facilitating the development of a concept for regulation of UAVs '*with respect to safety, security, airworthiness, operation approval, maintenance and licensing*'.

In 2012, the European Commission entrusted the European RPAS Steering Group (ERSG) [9] with organizing and coordinating the EU work on civil RPASs. The following year, the European Summit and the ERSG started planning a roadmap to enable progressive integration of drones into civil airspace from 2016 onwards and to improve the existing regulatory framework, covering all types of UAS except model aircraft and toys. Subsequently, in 2014, the Commission issued a Communication [10] in which it drew up a precise strategy for opening the market of civil UAS gradually and 'in a safe and sustainable manner' (especially with regard to the civilian environment). The same year, at the Transport, Telecommunications and Energy Council (TTE), a debate was launched on the future of civil RPASs with the aim of adopting a harmonized European approach (provided that national experiences were taken into account and on condition of a progressive integration into airspace).

In September 2015, the European Parliament's Committee on Transport and Tourism adopted a report on the safe use of RPASs [11] ,which

[9] The ERSG is a group of stakeholders consisting of the main organizations and experts interested in the integration of RPAS into the European Aviation System; it includes EASA, EUROCONTROL, EUROCAE, SESAR JU, ECAC, EDA, ESA, ASD, UVSI, EREA, and ECA (see *Final Report from the RPAS Steering Group*, June 2013).

Single European Sky ATM Research (SESAR) is a project to improve European airspace and its air traffic management (ATM) performance by modernizing and harmonizing the ATM system. The SESAR Joint Undertaking manages this project as a public-private partnership. See https://ec.europa.eu/transport/modes/air/sesar_en.

[10] 'A new era for aviation, Opening the aviation market to the civil use of RPASs in a safe and sustainable manner', COM(2014) 207 final.

[11] 2014/2243 INI – A8-0261/2015.

stresses that the EU framework should be clear, harmonized, proportioned, and founded on a risk assessment basis (the document also suggests having different regulations for commercial and leisure use).

Also, the Riga Declaration of 6 March 2015 on 'Framing the future of aviation' and the Helsinki Declaration of 22 November 2017 on 'Seizing digital technologies to deliver advanced drone operations safely and securely' form part of this strategy. In particular, during the Riga summit, the European aviation community agreed on five basic principles guiding the drone regulatory framework. Under these principles, drones should be treated as new types of aircraft and consequently regulated in proportion to the risk of each operation. Besides, the necessity is outlined for developing safety rules for drones at the EU level. Furthermore, it is remarked that technologies and standards need to be developed for the full integration of drones in Europe; in this regard, the declaration specifically mentions the *Single European Sky ATM Research (*SESAR) program [12]. In addition, the Riga Declaration observes that public acceptance and the respect of citizens' fundamental rights (e.g., privacy and protection of personal data, security risk, and noise) are key to the growth of drone services [13]. Finally, as regards the drone operator, he or she is considered responsible for the use of the device. Thus, to enforce responsibility, drones must at all times have an identifiable owner or operator.

In contrast, the focus of the Helsinki Declaration is on the need for EU leadership, so all initiatives of the industry on delivering the drone service market are welcome. Furthermore, the industry (including private-public partnerships) is invited to invest in research and development (R&D) and in projects contributing to the safe integration of RPASs (a particular reference is to the 2018 edition of the European ATM Master Plan by

[12] Single European Sky ATM Research (SESAR) is a project to improve European airspace and its air traffic management (ATM) performance by modernizing and harmonizing the ATM system. The SESAR Joint Undertaking manages this project as a public-private partnership. See https://ec.europa.eu/transport/modes/air/sesar_en.

[13] On this issue, see L. Filippi, *Intercettazioni: una riforma complicate e inutile*, *Diritto Penale e Processo*, 3, 2018, 294-305; L. Merla, *Droni, privacy e tutela dei dati personali – Drones, privacy and personal data protection*, *Informatica e Diritto*, I, 2016, 29-45; R. Ruggieri, *"Internet delle cose" e problematiche giuridiche: alcune considerazioni – "Internet of things" and legal problems: a few remarks*, *Ciberspazio e Diritto*, 1-2, 2016, 3-22; A. Santosuosso, C. Boscarato & F. Caroleo, *Robot e Diritto: una prima ricognizione*, *La Nuova Giurisprudenza Civile Commentata*, 7-8, 494-516.

SESAR). In the meantime, fragmentation along the EU boundaries is a matter of concern, and the declaration highlights that close collaboration is urgently needed to deliver an efficient regulatory framework. Finally, as regards public acceptance of drones (notably safety, security, privacy, and environmental protection), it was clarified during the Helsinki meeting that this could be learned from bottom-up initiatives based on practical expertise and tests deployed in real-life scenarios.

b) The Slow Steps Towards an EU Regulation.

Alongside the institutional initiatives at the EU level, it is worthwhile to recall the steps towards uniform European rules to govern civil drone activities. In this regard, *Policy for Unmanned Aerial Vehicle (UAV) Certification* (A-NPA 16-2005) was followed by *Policy Statement: Airworthiness Certification of Unmanned Aircraft Systems (UAS)* [14], which is remarkable because it establishes general principles for type certification of UASs. Representing the first step in developing a comprehensive civil UAS regulation and referring to Regulation (EC) No 216/2008 [15] (the so-called 'Basic Regulation', repealed by Reg. (EU) 2018/1139) and to Reg. (EC) No 1702/2003 [16], in Article 3 it states that '*Unmanned aircraft excluded from Agency* [EASA] *responsibility can be identified as* […those] *engaged in military, customs, police or similar services* …, aircrafts [of any mass] designed for research … and unmanned aircraft with an operating mass (MTOM, *recte* Maximum Take Off Mass) *of no more than 150 kg*'. Therefore, under these provisions, community standards on traditional aviation apply to any UAS having an MTOM above 150 kg. Moreover, Article 3 of E.Y013-01 stipulates: '*Safety oversight of an UAS excluded by the Basic Regulation is the responsibility of the Member States*.'

[14] E.Y013-01, adopted by the EASA in 2009.

[15] Regulation (EC) No 210/2008 of the European Parliament and of the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC (the 'Basic Regulation'). According to Article 139 of Reg. (EU) 2018/1139, Reg. (EC) No 216/2008 is repealed effective September 2018.

[16] Commission Regulation (EC) No 1702/2003 of 24 September 2003 laying down implementing rules for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations.

The rules cited above are relevant because they represent(ed) the weak point in the EU legislation. *De facto*, most existing civil drone types have an MTOM of less than 150 kg and, therefore, are currently regulated under national law. From the viewpoint of practical application of law, such legal fragmentation translates into market fragmentation. As underlined in the European Commission's Communication COM(2014) 207 final (3.1), '*The current regulatory system for RPAS based on fragmented rules for ad hoc operational authorizations is an administrative bottleneck and hampers the development of the European RPAS market. National authorizations do not benefit from mutual recognition and do not allow for European wide activities, either to produce or to operate RPAS*.'

The EASA document *Concept of Operations for Drones*, published in May 2015, suggests a different methodology, founded on a risk-based approach. Basically, the EASA proposes to establish three categories of drone operations and their associated standards: (a) Open category (for low-risk activities, suitable for drone operations requiring no authorization from a national aviation authority), (b) Specific category (for activities of medium risk, implying drone operations needing authorization from a national aviation authority), and (c) Certified category (for high-risk activities, involving operations and requiring rules and equipment similar to manned aircraft). The document also states: '*Protection of other public interests such as privacy and security … will need to be addressed at the same time as the safety risk and will be dealt with at National Level*.' Such an approach is deemed acceptable to society while at the same time offering enough flexibility to industry. That document was followed in the same year by *Advance Notice of Proposed Amendment: Introduction of a regulatory framework for the operation of drones* (A-NPA 2015-10) and two EASA Technical Opinions (Opinions of a technical nature), namely *Introduction of a regulatory framework for the operation of unmanned aircraft systems in the 'open' and 'specific' categories* (Opinion No 01/2018) and *European Commission policy initiative on aviation safety and a possible revision of Regulation (EC) No 216/2008* (Opinion No 01/2015). Basically, the European Commission presented proposals to enforce the aviation strategy in Europe and repeal the EASA's former Basic Regulation (Reg. (EC) 216/2018). The aim was to prepare the EU aviation system for the challenges posed by the fu-

ture, including innovation and digital technologies. In addition, the proposal would strengthen the EASA's competencies and set a basic legal framework for safe development of drone operations.

Also, in July 2018, the EU Council adopted Reg. (EU) 2018/1139 on common rules in the field of civil aviation (the so-called 'New Basic Regulation') [17]. This provision identifies the process followed by the European Commission to adopt the new regulation and introduces updated aviation safety rules, including a revised mandate to the EASA and repealing, Reg. EC 216/2008. Therefore, this instrument represents another step towards a comprehensive, specific EU legislation and with a view to proposing common EU rules for all unmanned aircraft independent of their MTOM (in fact, classifications should have regard also to hazard level). In this new format, drones are explicitly covered and have more space.

The recitals in EU legislation are interpretive tools referring to further clarification on principles and legislative provisions to which they relate. About Reg. (EU) 2018/1139, the most relevant recitals on unmanned aircraft are Nos. 26 to 34, 77, 85 and 87. As regards civil drones of all sizes, recital 26 states: '*Since unmanned aircraft also operate within the airspace alongside manned aircraft, this Regulation should cover unmanned aircraft, regardless of their operating mass. Technologies for unmanned aircraft now make possible a wide range of operations and those operations should be subject to rules that are proportionate to the risk of the particular operation or type of operations*.'

According to Article 2, 'This Regulation shall apply to: (a) the design and production of products, parts and equipment to control aircraft remotely by a natural or legal person under the oversight of the Agency [EASA] or a Member State, to the extent not covered by point (b); (b) the design, production, maintenance and operation of aircraft, as well as their engines, propellers, parts, non-installed equipment and equipment to con-

[17] Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2011/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91.

trol aircraft remotely, where the aircraft is or will be: … (iii) an unmanned aircraft, that is registered neither in a Member State nor in a third country and that is operated within the territory to which the Treaties apply by an aircraft operator established, residing or with a principal place of business within that territory ….'

With regard to the implementation of the risk-based approach and the principle of proportionality, recital 27 clarifies that '*a degree of flexibility should be provided for the Member States*'.

Moreover, Reg. (EU) 2018/1139 includes specific definitions of 'unmanned aircraft' (Art. 3 subpar. 30), 'remote pilot' (Art. 3 subpar. 31) and 'equipment to control unmanned aircraft remotely' (Art. 3 subpar. 32). Besides, by amending some EU regulations on aviation (and other provisions), Reg. (EU) 2018/1139 also introduces *ad hoc* dispositions for drones. Above all, Reg. (EU) 2018/1139 contains a section (VII, Arts. 55-58) on 'Unmanned Aircraft', including provisions on 'Essential requirements for unmanned aircraft', 'Compliance of unmanned aircraft', and 'Implementing acts as regards unmanned aircraft'. Annex IX to Reg. 2018/1139 contains other 'Essential requirements for unmanned aircraft'.

The aforementioned EASA Opinion No 01/2018, in accordance with the so-called New Basic Regulation, forms the basis for setting up a regulatory framework defining measures to mitigate risks from drone operations in the Open and Specific categories. It is furthermore important to note that – after an interinstitutional agreement between the Council, Commission, and Parliament of the EU, reached on 22 December 2017 – the EU's competence has been extended to cover the regulation of UASs regardless of their take-off-masses. As stated in the same Opinion, its draft text was first developed by EASA and then all interested parties (about 215 stakeholders, including industry, national aviation authorities, UAS operators, and other qualified entities) were consulted from 5 May to 15 September 2017 through a Notice of Proposed Amendment (NPA 2017-05).

As a general consideration, the New Basic Regulation contains general provisions requiring more specific rules (implementing regulations). Given that the aim is to share the same spaces, there shall be a unique, general, and harmonized framework supported by corresponding detailed rules.

During publication process of this article, the European Commission adopted a Delegated Regulation and related Annex – C (2019) 1821 final – defining technical requirements for drones in order to be flown safely and to help innovation and investment. They set features and capabilities that unmanned aircraft must have. If the EU Parliament and EU Council do not raise objections, both acts will become gradually applicable. More recently entered into force the Commission Implementing Regulation (EU) 2019/947 of 24 May 2019 on the rules and procedures for the operation of unmanned aircraft. By 2022 the transitional period will be completed and the new EU regulation will be fully applicable.

5. – As mentioned above, until a comprehensive EU normative on drones enters into force, civil drones with an MTOM of no more than 150 kg are subject to the internal legislation of Member States.

In Italian law, Article 743 of the Navigation Code includes drones under the concept of aircraft and empowers the Italian Civil Aviation Authority (ENAC) to lay down specific rules. Accordingly, ENAC has adopted a Regulation on Remotely Piloted Aerial Vehicles, which is regularly updated, the last update being in May 2018 (Issue 2 Rev. 4). The intention of the Italian legislation is to comply gradually with the new rules at the European level. Currently ENAC submitted for discussion a new (draft) edition (2019) of its Regulation at sector experts.

Article 2 of the Italian regulation states that it applies '*to the operations of RPAS under ENAC competence and to the activities of model aircraft, inside the Italian National Air Space*'. Besides, Article 2.2 specifies that '*RPAS of operating take-off mass not exceeding 150 kg and those designed or modified for research, experimental or scientific purposes pertain to ENAC competence*'.

The latest update of the regulation introduces some new material, basically laid down in Articles 10 and 11 (about 'critical operations' and 'authorization and declaration' respectively). In particular, by introducing standard scenarios depending on MTOM and the operational scenario, it sets up requirements adequate to the increasing level of risk, with a view to ensuring the safety levels that the regulation requires. Another aim is to reduce administrative (bureaucratic) waiting time.

For completeness, it should be noted that, under Italian law, there are

also regional regulations (those issued by the respective Italian regions). These regulations draw attention to all possible uses of drones. For example, a Piemonte Region law (Decision No. 17-2814 of 18/1/2016 on natural areas and biodiversity protection) regulates more strictly the use of drones within its territory. Similarly, a Management Order of Liguria Region (Decreto Dirigenziale 598/2013) provides for the possibility of drone use in phytosanitary (plant health) measures.

6. – In the statistical survey we conducted in June 2018 on 'Production and use of drones today in Italy' and on which we report in sections 7 through 10, the questionnaire included some open-ended questions on technical aspects and legal issues favouring the development of drone business. In particular, for each of the two issues considered (technical and legal), two questions were asked, so that interested parties could express their respective priorities. Very briefly, the list of the aspects considered most relevant is given below.

6.1 – The issue of battery supply is considered the most important, followed by the need for longer flight duration. Almost as important is the interest in safety. Thirdly, respondents have expressed some interest in the sensor issue (i.e., number of sensors onboard, miniaturization, and price). Last is the matter of drone identification.

6.2 – In reply to the question about legal issues, responses are multilayered. In this case, respondents consider the most important matter to be the need for clarity and simplification in legislation. Second is the issue posed by bureaucracy and processing time. Almost as important is the need for standardization of regulation at the EU level (at least). Another important aspect relates to the need to introduce a 'beyond visual line of sight' (BVLOS) flight rating. Last but not least is the concern about regulatory restriction. In this case, however, most respondents referred to the need to introduce restrictions in the sale phase (specifically, in the sense that the purchase of a drone should be limited to those possessing certificates of competency); on the contrary, few respondents are interested in the removal of legal limits.

7. – In presenting the main results of our statistical survey [18], conducted in June 2018 on 'Production and use of drones today in Italy', the analysis first concerns the temporal and territorial variations of the drone market; then the employment and the turnover and, subsequently, other important aspects of drone companies, such as prevalent activity type, field of use, reference sector (civilian or military), target market (professional or not), activity sphere (public or private), and level of internationalization of the company. Section 10, finally, deals with some of the factors which determine the future development of the drone market. These factors concern the investments made in the sector, commercial strategies, the kind of training to prefer, collaboration with universities, and the geographic area to focus on.

The first two dimensions of companies working in the drone market are the temporal and spatial dimensions, which we detected via the questions 'First year of activity with the drones' and 'Municipality of company HQ'.

[18] The survey was carried out using the Computer Assisted Web Interview (CAWI) method, implemented by LimeSurvey, by administering a prestructured questionnaire to a self-selected sample of companies operating in the drone market. The sample is not, therefore, probabilistic, and its results cannot be extended to the entire population via the statistical inference because the list of unities and the amount of the population are not exactly available. Therefore, given the explorative nature of the investigation, the analyses conducted are based, except in one case, on univariate descriptive statistics and will have an preliminary indicative value. This also applies in the case of the only two generalizations (non-inferential) from the sample to the population, concerning the number of employees and the turnover of the companies in question. For the survey, conducted in June 2018, 505 companies were contacted, ie all the companies known to be operating in the sector. The investigation took place via an e-mail containing the link for the compilation of the questionnaire; 207 companies filled in the questionnaire (41.0% of the contacts), 100 partially and 107 fully. It needs to be said that the data elaborations do not cover all the questionnaires, but only the 107 completed, which correspond to 51.7% of respondents and to 21.2% of contacts. Ultimately, our investigation, like all CAWI surveys (Bethlehem & Biffignandi, 2012; Callegaro, Lozar Manfreda, Vehovar, 2015; Couper, 2008; ISTAT, 2017; Menegaki & Tsagarakis, 2013; Tourangeau, Conrad, Couper, 2011), suffers from intrinsic limits, such as the partial coverage of the population and missing responses from interviewees (Biffignandi & Pratesi, 2002; Fan & Yan, 2010; Ilieva, Baron, Healey, 2002; Weber & Bradley, 2006; Wright, 2005). However, in the face of these disadvantages there are several advantages such as low running costs, the speed of data collection, and the possibility of processing in real time. The previous methodological aspects will find more space in a later contribution on the subject.

For the first question, the modalities of the variable were grouped into three classes: before 2006, 2006-2013, and 2014-2018. For the second question, the municipalities were grouped into the four Italian geographic areas: Northwest, Northeast, Central Italy, and South/Islands.

7.1. – Drones are a very recent phenomenon, such that almost three-quarters of the companies interviewed (72.6 percent) have been in the sector for less than five years (2014-2018), and before 2006 there were none at all.

It is interesting to note that the average size and average turnover of the companies vary according to the time period considered. In detail, moving from 2006-2013 to the most recent period (2014-2018), we note an increase in workforce per company and average turnover. These trends are linked, in that the turnover depends on the number of employees. More specifically, the average size of the workforce rose from 5.17 units in 2006-2013 to 6.49 units in 2014-2018, with an increase of 25.53 percent. In parallel, the trend of the average turnover is in line with that of the average workforce size. In fact, passing from 2006-2013 to 2014-2018, the average turnover rose from €557,000 to €695,000, a 24.78 percent increase. This percentage, due to the aforementioned link, is very close to that calculated for the average workforce size.

Finally, a comparison between the year the company was established and the year it began its activity with drones shows how many companies have modified and/or integrated their activity. It emerges that nearly half of the companies (48.1 percent) have always worked in the drone market. The other half, on the contrary, entered after being in another business awhile, either by converting from the previous activity or by adding to it the production or use of drones.

7.2. – Passing on to the territorial distribution of the respondent companies, most of them (44.8 percent) are concentrated in the Northwest, where there is the highest demand for drones and their services. The Northeast follows with 23.8 percent of companies and is followed by, almost on a par but more detached, Central Italy at 16.2 percent and the South/Islands at 15.2 percent.

It needs to be said that many companies have headquarters in the two Italian metropolises of Rome and Milan, and only one is located abroad, in Switzerland.

The companies interviewed are distributed fairly uniformly among the three demographic classes of Italian municipalities – small, medium, and large. In detail, 35 percent of the companies belong to the first class of fewer than 20,000 inhabitants, 30 percent to the second (from 20,000 to 100,000), and the final 35 percent to the third class (more than 100,000 inhabitants).

It is also interesting to examine how the average size and turnover of the companies vary by geographic location. The classification that emerges has Central Italy in the prime place, followed by the Northeast and Northwest, with the South/Islands lagging well behind. In detail, using the average workforce as indicator of company size, the value corresponds to an average of 8.19 manpower in Central Italy, 7.88 in the Northeast, 5.48 in the Northwest, and only 2.88 in the South/Islands.

Furthermore, a trend in turnover per company in line with that of the average workforce emerges. In fact, the values of average turnover match, respectively, at €1,209,000, €775,000, €538,000 and €231,000.

These results lead to two conclusions. First, while the largest number of companies working in the drone market are concentrated in the Northwest, it is also true that they are, on average, smaller companies and have a lower turnover than in the Northeast, and especially in comparison to Central Italy. The second conclusion highlights the fact that a divide emerges in the drone market between the South/Islands and the rest of Italy in terms of average company size and turnover. In fact, passing from North-Central Italy to the South/Islands, the average company workforce goes down from 6.67 to 2.88 units, equal to a 56.82 percent decrease. Even more marked is the fall in the average turnover, which drops from €731,000 to €231,000 euros, equal to a 68.40 percent decrease.

8. – Two fundamental features of any company are, as is well known, size and capacity to generate wealth. These aspects, represented respectively by the average number of employees and the average turnover per company, are further analysed here to complete the previous picture.

a) Average and total workforces in drone companies.

Most of the companies we examined (74 percent) have a workforce under 5 units, and only 7 percent employ more than 15. These are therefore small or very small companies, and in fact 40 percent of the total are one-man businesses, where the owner does everything. Vice versa, only 5 percent are medium-sized and large companies, those with a workforce of at least 30 units.

The companies that responded to the survey employ on average just over 6 workers per company. Based on the hypothesis that the average value of this sample is approximately equivalent to the average workforce of all 505 companies known to be operating in the sector, it can be estimated (in a non-inferential way) that a total of more than 3,000 workers are employed in the drone field in Italy.

b) Average and total turnovers of companies in the drone market.

The small average size of companies is reflected in the turnover, which for more than two-thirds of them (69 percent), is under €200,000 per year. Vice versa, there are relatively few companies (8 percent) with a turnover of more than €1,600,000 per year, while only in some cases are much higher amounts reached.

The average yearly turnover stands at €656,000. On the assumption that the sampling average approximates the average turnover of the universe of the 505 companies known to be operating in the sector, it can be estimated (in a non-inferential way) that the total turnover is over €330 million. This is an underestimation because one enormous company has been excluded; otherwise, as an outlier, it would have made the average and total turnover too high.

A useful exercise is based on the link between workforce size and turnover, in the hypothesis that turnover grows as the number of employees increases. To test out the meaningfulness, sign, and intensity of such a link, one can use a linear regression model (with intercept equal to zero), where workforce size is the explicative variable (independent) and turnover is the response variable (dependent). The estimated parameter (angular coefficient), which measures the link between the two variables, presents

characteristics in line with expectations, having a fully meaningful value with positive sign and intensity stands at €168,000. This means that when one extra member of staff is taken on, the company's estimated turnover goes up by €168,000. Therefore, based on the estimated model, moving from a company with 1 employee to one with 10, the estimated turnover rises from €168,000 to €1,680,000 per year.

9. – This section examines other important aspects of drone companies: the prevalent activity type, field of use, reference sector (civilian or military), target market (professional or not), activity sphere (public or private), and level of internationalization of the company.

a) Prevalent type of company activity and main field of use.

For almost all the operators interviewed (86 percent), their main activity is using drones to supply services. This percentage varies significantly for companies for which the services with drones are a secondary activity.

Almost two-thirds (61.5 percent) of the companies not dealing with services are producers, while far lower percentages of companies produce software for drones (15.4 percent) or import drones and/or components (7.7 percent) or sell these (15.4 percent, including those which sell online).

In interpreting the previous results, it must be taken into account that they refer to the unique or prevalent activity. Clearly, when the previous activities are secondary, the distribution of the companies becomes quite different.

Another interesting feature to evaluate is the way the average size and turnover per company vary according to the company's prevalent activity, passing in particular from service companies to the other types analysed above. Service companies are smaller and have lower turnovers than the other typologies we examined. In fact, service companies have an average workforce of 6 units and average turnover of €486,000 euros, while the others have an average staff of 7 units (17 percent more) and an average turnover which rises to €1,133,000 (133 percent greater).

As for main field of use, it appears that the products and services furnished by the responding companies find limited use in military contexts, in search and rescue of people/animals/things, and in pastimes and sports.

This obviously does not mean that in these areas the use of drones by the sampled companies is marginal, because there could be a non-prevalent use.

The most widespread primary uses of drones are, to the same extent, the following two: photography/video recording and topographical/photogrammetric detections (including those in agriculture). These, together, concern almost three-quarters (72 percent) of the companies. Follows at a distance the plant control activity (11 percent of the companies), while the other fields of primary use of drones (construction, environmental analysis, vigilance/security, and civil protection) are reported by no more than 5 percent of the companies.

b) Reference sector, target market, activity sphere, level of internationalization.

As for the sector of reference, in the vast majority of cases (86.5 percent) drone products and services are offered in the civilian sector exclusively. Consequently, there are far fewer cases (12.5 percent) of companies working exclusively with the military sector. Finally, there is a negligible percentage of firms (1 percent) furnishing products and services to both civilian and military sectors. It appears, therefore, that the companies make a clear-cut choice of the unique sector in which to operate.

Before going on to the next two aspects, concerning the target market (professional or not) and the sphere of activity (public or private), it should be made clear that these aspects are considered only for companies operating in the civilian sector, because those working for the military sector relate obviously to the professional market and public sphere.

As for target market, almost all the companies (95 percent) target the professional market either exclusively or primarily. Although there are only a few companies (5 percent) whose single or prevailing market is not the professional one, there can be significantly more companies whose secondary market is nonprofessional (recreational/consumer market).

Analysis of the drones' activity sphere shows that drones are used much more in the private sector than in the public sector. In fact, almost two-thirds (62.3 percent) of the companies interviewed said they operate more in the private sector than in the public sector. Moreover, about half of the

previous companies indicate a very high percentage (at least 70 percent) of use of the drones in the private sector. Vice versa, a nonnegligible share of companies (19 percent) indicated that their drones are used in equal measure in the public and private sectors, without any predominance of one sector over the other.

Other interesting information on the drone market concerns its level of internationalization, which can be measured approximately by the percentage of turnover due to the foreign market. Our results indicate that this percentage is very low: the turnovers are almost exclusively a fruit of the domestic market. In fact, the portion of companies invoicing only or mostly in Italy is 92.5 percent of the total, and most of them (more than four-fifths) indicate very high domestic turnover, equal to at least 90 percent of the total. Vice versa, the portion of companies invoicing only or mostly abroad and those invoicing in equal measure in both domestic and foreign markets is not more than 5 percent of the cases, being respectively 2.8 percent and 4.7 percent. This shows that there are limited exports of Italian drone technology and thus there is ample room for growth.

These results are presumably related in a rather high degree to the small average size of the companies analysed.

10. – The last section of this article deals with some of the factors which determine the future development of the drone market. These factors are investments made in the sector, commercial strategies, the kind of training to prefer, collaboration with universities, and the geographic area to focus on.

Company expenses for investment have been disaggregated into the following items: plants/equipment, development/research/training, marketing/advertising, and other investment. Our results show that expenses for hardware dominate all the others. Indeed, more than two-thirds (67 percent) of the responding companies have invested primarily in plants and equipment, 27 percent mainly in development/research/training, and the remaining 6 percent mostly in marketing/advertising.

To correctly interpret these results, one must bear in mind that they can vary if, on one side, we take into consideration the secondary rather than main expenses for investment and if, on the other, we examine com-

mercial strategy instead of investment strategy.

Regarding which commercial strategy to focus on, the largest portion of the companies (43.4 percent) hold that the best choice for future development of drones lies in investment in innovation, research, and development. Vice versa, 27.3 percent believe it is better to focus on promotion/marketing/advertising (both on- and offline). Far fewer companies give their top ratings to client service and assistance (9.1 percent), the commercial network (8.1 percent, as for the 'Other items'), and lastly, strangely enough, pricing policies (4 percent). Thus, prices are held to be only marginally a strategic lever for the future growth of the drone market. On the contrary, investments in innovation, research, and development are considered essential.

According to the respondents, the type of training to focus on is technical training, prevailing overwhelmingly over all the other types of training considered. In fact, most of the companies (62.4 percent) believe that technical training is the most important for their staff. If we add, for homogeneity, information technology (IT) training, the share increases by 10 points, reaching 72.3 percent. There is far less consensus for commercial training, reported as most important by 16.8 percent of the companies, and for managerial training (5 percent). This last result is presumably linked to the small average size of the companies analysed.

An important aspect of training and research is possible collaboration with universities and research centres. A fairly large number of companies (33 percent) declare that they collaborate with at least one university on common research projects. As is to be expected, most of these collaborations (75 percent) involve Italian universities. There are, however, contacts with foreign universities and non-university research centres, declared by 10.42 percent and 14.58 percent of the companies, respectively. Most operators (72 percent) collaborate with only one university. There are, however, a certain number (12.49 percent) declaring that they have collaborated with at least four universities.

Finally, we take into consideration the geographic areas that, in the opinions of the responding companies, have the greatest prospects for development of the drone market. The answers show that the European Union has the greatest growth potential, as reported by half of the re-

spondents. All the other areas are indicated to a much lesser extent. In detail, the United States and Canada are chosen by 16.3 percent of the companies, Africa by 15.2 percent, and the BRIC countries (Brazil-Russia-India-China) by 12 percent. The higher percentage ascribed to the African countries may be due to the assumption that Africa, starting from a lower level of development, can record higher growth rates in the future compared to the BRIC countries, which today are already at a higher level. The importance of the BRIC countries emerges indirectly from the fact that they are located in areas that would be largely ignored without them. In fact, when Russia, India, and China are excluded from Asia and Brazil is excluded from South America, the remainder of Asia and Latin America is indicated respectively by only a few companies (5.4 percent) and by a very few (1.1 percent) as the area having the greatest prospect for growth of the drone market.

Besides the research lines indicated above, there are others which do not appear in this article but are interesting, as for example the link between the growth potential of the various areas considered and the export forecasts in them by Italian companies of the drone sector.

11. – Drones, which can be defined as 'unmanned airborne vehicles driven at a distance', have experienced a tumultuous development in recent years. Their use, initially strictly military, has extended to the civilian sector with tasks of, for example, civil protection, rescue, relief of the territory, public order, traffic control, video shooting, means of transport, plant maintenance, and precision intervention in agriculture.

The novelty of this phenomenon and its rapid transformation make it necessary to create both an appropriate regulatory framework, which regulates the ways and limits of using drones, and an adequate knowledge framework which highlights their positive and negative aspects. To achieve these two objectives, we used a multidisciplinary approach which integrates the legal analysis with the statistical one. The result of this approach is the present article, the contents of which we will summarize in this section, with reference to both the legal and statistical parts. For the statistical part, the data source is the survey we conducted in June 2018 on the subject of 'Production and use of drones today in Italy'.

Starting with defining and classifying problems, the juridical analysis first pointed out that there is no perfect harmony to the nomenclature. Nevertheless, Italian and international legislation agree in treating drones as analogous to aircraft and, as such, subject to the rules on aviation. The legislation was examined first at an international level, then at the European level and finally at the Italian level.

At the international level, we illustrated the central role played by the ICAO. The ICAO has always been committed to fostering the emergence of a complete and harmonized regulatory framework that internationally regulates the civil uses of drones. At the European level, we examined in detail the ongoing EU legal progress on the matter. At first, the EU's overview was greatly limited because most drones were excluded from its scope and, under the same EU law, their regulation was left to each Member State. This led to a fragmentation in the European Community drone market. Recently, however, the regulatory committee procedure proposed by the EASA has been discussed as a prerequisite for the adoption of comprehensive EU legislation on drones. On May 24, 2019 entered into force the Commission Implementing Regulation (EU) 2019/947 on the rules and procedures for the operation of unmanned aircraft. By 2022 the transitional period will be completed and the new EU regulation will be fully applicable. The last level analysed was the national one, with particular reference to the body that regulates drones in Italy. This, according to Article 743 of the Navigation Code, is ENAC, which has updated in May 2018 the Italian Regulation on RPAs. Currently ENAC submitted for discussion a new (draft) edition (2019) of its Regulation at sector experts. In general, the intention of the Italian legislation is to gradually comply with the new rules at the European level.

The direct link between our juridical analysis and our statistical survey is the part of the questionnaire which detects the two legal factors most favouring the development of the use of drones. According to the interviewees, this development can be stimulated, above all, by legislative clarity and simplification and, second, by standardization of regulations at the EU level. For both factors, the results of the survey accord with what our legal analysis affirms.

Going to the statistical part of the article, the Italian companies work-

ing with drones amount, at least those contacted, to a not-inconsiderable number--505 or more--which according to the survey preliminary results have a total of more than 3,000 employees and a turnover of over €330 million. These companies are generally small, because the average number of employees and the average turnover are low. Nevertheless, it should be underlined that these average values have shown a strongly increasing trend over time, with clear growth in the number of employees per company as well as the turnover. It is therefore foreseeable that in the future these values will align with those of other more-developed sectors. Unfortunately, even in the drone market there is a gap between southern Italy and the central-northern Italy, with the South/Islands presenting a more disadvantaged situation, in this sector, compared to the rest of the country.

To outline the profile of the companies interviewed, it is appropriate first of all to consider the company's primary type of activity and main field of use of drones. The vast majority of these operators are service companies, mainly engaged in fields related to photography/video recording and to topographical/photogrammetric detections (including those in agriculture). Other important aspects in profiling companies are the reference sector, the target market, the activity sphere, and the international exposure. The picture that emerges from the survey is the following: the companies largely address the civil sector, in which there is a preference almost exclusively for the professional market; moreover, the sphere of activity mainly concerns the private sector, while the companies' presence in international markets is still very slight. Although Italian drone exports are currently very limited, quite large future growth margins cannot be ruled out.

The other factors that are useful for completing the profile of the interviewed operators, determining the future development of the drone market, are: investments, commercial strategy, training, collaboration with universities, and geographic area with the greatest growth potential. Most companies are characterized by: investments mainly in plants and equipment; commercial strategies based primarily on investment in research and development; training courses that are mainly of a technical nature; quite numerous collaborations with universities on joint research projects; and, finally, identification of the EU as the area with the greatest potential for development of the sector and as the main outlet for exports.

A final observation is that the drone market is still a youngster that, despite the errors of youth, is growing strongly. This is a sector that is still little known and, therefore, is worthy of further analysis building on multidisciplinary approaches like the one used in this article.

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Abstract

The emerging drone market presents opportunities and challenges. The development of these remotely piloted aircraft systems (RPASs), also known as unmanned aerial vehicles (UAVs), is growing also in Italy, as elsewhere. In the face of an increasing demand, related to a large range of civil applications, statistical analysis of the phenomenon and the current legal framework do not yet seem to correspond fully to market reality and expectations. The present article illustrates both the main results of our recent survey on the drone market in Italy and actual (and future) regulations, seeking to contribute to the advancement, respectively, of statistical knowledge and juridical treatment of drones.

Il mercato emergente dei "droni" presenta opportunità e sfide. Lo sviluppo di questi aeromobili, noti come Sistemi di Aeromobili a Pilotaggio Remoto (SAPR), sta interessando ampiamente anche l'Italia, assieme ad altri numerosi Paesi del mondo. Di fronte all'incremento della domanda, connessa con un ampio spettro di applicazioni ad uso civile, l'analisi statistica di questo fenomeno non sembra attualmente corrispondere del tutto alle aspettative e alla realtà del mercato. Analoghe considerazioni si possono fare per l'articolato normativo esistente, che non sembra soddisfare pienamente le esigenze degli utilizzatori e degli operatori economici del settore. Questo articolo cerca di colmare dette lacune, sia illustrando i risultati di una recente indagine statistica condotta sul mercato italiano dei SAPR, sia effettuando una ricognizione dell'attuale e futura regolamentazione giuridica: il proposito primario è quello di contribuire a migliorare la conoscenza sia statistica che giuridica del fenomeno dei "droni".