Agents of Firearms Supply in Sixteenth-century Italy: Rethinking the Contractor State

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Abstract

This chapter investigates the people and organizations involved in the supply of firearms for military use in sixteenth-century Italy, as guns became a key technology in European warfare. Agents of supply ranged from gunmakers (including the Beretta firm) to ropemakers, from bankers to customs officials, from city captains to leatherworkers and scrap metal dealers. Through a 'bottom-up' exploration of this chain of supply and maintenance, considering both formal and informal processes, it offers new perspectives on the functioning of the contractor state. It argues that the state's ability to purchase arms effectively depended on local patrons and connections and that the contractor state's development should be considered across the space spanned by supply chains as well as over time.

Keywords

firearms, guns, contractor state, arms industry, military revolution

Introduction

On 16 August 1571, less than two months before the Battle of Lepanto, the Papal States contracted with Bernardino Busle of Brescia for the supply of 1,500 arquebuses. The contract, concluded by Bartolomeo Bussotto, Treasurer of the Holy See, stipulated the length of the gun barrel (four Roman palms), that it should be well-worked and reinforced at the breech and that it should be suitable for three-quarter ounce shot, as well as detailing how the

accompanying powder flask and priming flask should be supplied.[1] This may seem a straightforward transaction, but the reality of fulfilling such contracts was complex, even while they were essential to early modern warfare. In the military context, states frequently contracted out elements of defence, buying in not only weapons but also the services of mercenaries. Military entrepreneurs, whether producers or brokers, and their employees or sub-contractors, fulfilled this demand. The term 'contractor state' is used to describe the state in this role as purchaser of services: this concept is closely related to that of the fiscal-military state, which aims to account for how the state raised money to fund this activity.[2]

Behind the entrepreneurs who supplied the contractor state, however, were many more individuals and organisations. Those involved in the supply of firearms for military use in sixteenth-century Italy ranged from gunmakers to ropemakers, from bankers to customs officials, from city captains to leatherworkers and scrap metal dealers. Through an exploration of the chain of supply and maintenance, this chapter offers a 'bottom-up' analysis

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[1] Zanelli: the document is in Archivio di Stato di Roma (ASR), Archivio Notarile 3460, notaio Antonio Guidotti (1571), vol. 2, p. 167. 'Che la canna dell'archibuso debba essere longa palmi quattro di Roma, ben lavorata, et rinforzata alla culata et di tre quarti d'oncia di palla, con la mira aperta ed il focone, grandi, incassati alla spagnola con gran calcio a proportione della canna si come si costuma in simile sorta d'archibusi. Le fiasche che portino da diciotto in venti oncie di polvere per ciascuna, con la cargatura in proportione della palla che porta l'archibuso, come si costumano coperte di corame bono con cordoni et fiocchi di filo et così li fiaschettini, bene inchiodate et ben ferrate alli canti acciò stiano saldi come si costuma.'

[2] Fynn-Paul, esp. the Introduction by Fynn-Paul, Marjolein 't Hart and Griet Vermeesch, 1-12; Parrott; Wilson and Klerk.

of the contractor state's practical functioning. It investigates the power of producers in the face of competition between states, the role of middlemen and the significance of their personal connections, and state attempts to monitor key processes. Its findings point to new lines of enquiry concerning the relevance of firearms to the 'military revolution' debate and to our understanding of the contractor state in early modern Italy and beyond.

There is a considerable literature on late medieval and early modern guns, but it is not well-integrated and the arms industry per se has received limited attention. Developments in Italy have been rather marginal to the debate about a 'military revolution',[3] and in any case that debate has generally regarded handguns as significant primarily in relation to shifting battlefield tactics and the consequent need for different types of military management and training.[4] Until recently much literature on Italian handgun production focused on the identification of gunfounders, although there is also an important history of the Beretta firm,[5] while local histories of Brescia and Valtrompia, the most significant production area, provide further information.[6] The work of Michael Mallett and John Hale on the military organization of the Venetian state set this in wider context,[7] as have subsequent studies of the Italian Wars (1494-1559).[8] In these broader analyses the role of arms manufacturers, who served a clear

[3] Pezzolo.

[4] For key readings see Rogers; more recently Jacob and Visoni-Alonzo have rejected the idea of a military revolution altogether.

[5] Barbiroli; Morin and Held.

[6] Bolognini; Bossini and Galeri; *Armi e cultura nel bresciano, 1420-1870* (esp. Morin); *Antologia gardonese*; Odorici; Cominazzi.

[7] Mallett and Hale.

[8] Sherer; Arfaioli; Mallett and Shaw; Shaw; Pellegrini; Bowd; Butters and Neher.

purpose for the state in the military context, but also had their own interest in promoting weapons use and encouraging the expansion of firearms technology, has often been lost, but this has begun to be remedied with the publication of several important studies: Luca Mocarelli and Giulio Ongaro on the arms industry in seventeenth-century Brescia; Fabrizio Ansani on artillery production in Florence; and Walter Panciera on the gunpowder industry in Venice. To these should be added the work of David Parrott, who takes a broader European view on the question of military enterprise.[9]

The sources for the history of handguns in sixteenth-century Italy are fragmentary. Regime change in the large centres of Bologna, Florence and Milan disrupted institutions and record-keeping.[10] Indeed, there are few military archives with consistent series through the Italian Wars (that of the duchy of Ferrara, in Modena, is an important exception). The records of Brescia and Venice, which might shed light on handgun production, likewise have numerous lacunae: the earliest sixteenth-century Brescian ducal register covers the years 1528-33, but consistent records begin only in 1546.[11] Nonetheless, taken together these sources provide a good deal of information about the practicalities of arms exporting, and for corroboration I have looked more broadly, including at the 'conti straordinari' of the fond 'Soldatesche e Galere' in the Archivio di Stato di Roma, which concern papal military campaigns, and at documents from Florence and Modena. I am particularly concerned to investigate what scholars of present-day small arms proliferation call 'weapons flow': in

[9] Mocarelli and Ongaro; Ansani; Panciera; Parrott.

[10] The difficulties are compounded by the fact that the Florentine military archive does not even have an index.

[11] Archivio di Stato di Brescia (ASBs), Cancelleria prefetizia inferiore, Registri ducali (Canc. pref. inf., Reg. ducali).

other words, the flow of guns from the original source of production (where they are generally produced for some legal purpose) to their end use (which may or may not be legal). While we do not have access to all the techniques used today to track weapons, the method makes clear that then as now these flows are complex and involve multiple actors.[12] This essay focuses on one route along which weapons moved: the legitimate military supply chain, considering five stages of firearms supply: production, purchase, transport, distribution, and the supply of ancillary goods such as match-cord, powder-flasks and shot.

The terminology of small arms requires some explanation. In the sixteenth-century context, ‘arquebus’ typically refers to guns that can be fired from the shoulder without a support to steady them. The *archibusone* (literally, 'large arquebus') required a stand and is generally listed alongside heavier artillery in the records. Handguns were also known as *stioppi* or in smaller sizes *schioppetti*; this weapon is sometimes (but not necessarily) distinguished from the arquebus by the fact that an arquebus has a trigger while a *schioppetto* requires both hands to fire. Guns came in three sections, which were produced, and could be bought and sold, separately: a lock (the firing mechanism), a stock (the wooden case) and a barrel. Military guns were most often fired with what was called a matchlock, which brought a long, slow-burning cord – the match – into contact with the gunpowder. An alternative mechanism, the wheellock, was developed late in the fifteenth century and became a source of significant social anxiety because it could be concealed beneath clothing. States legislated to ban wheellocks, particularly on shorter guns, but most of them allowed exemptions: exempt groups included elite bodyguards, and sometimes (though not invariably) individuals of high rank. Nonetheless, over the course of the sixteenth century, wheellocks proliferated to

[12] The present-day process of tracking arms flows (and the challenge even twenty-first century sources pose) is discussed in Jenzen-Jones and Schroeder.

the point that they became the weapon of choice for both bandits and travellers seeking protection from attack.[13] Most soldiers, however, continued to use matchlocks, with the exception of elite cavalry for whom the advantage of firing one-handed outweighed the cost and reliability problems associated with the wheellock.

The proliferation of small firearms in Italy began in the fourteenth century. One was used in a homicide in 1440s Bologna.[14] They were increasingly deployed in military contexts: a Niccolò d'Este (probably the claimant to the marquisate of Ferrara) bought fifty *schioppetti* in 1469, and in 1483 the castellan of Casale sul Po described the fortress as 'well-supplied with bombards and arquebuses'.[15] A 1490s inventory of the fortress at Valiano (near Montepulciano) included a variety of firearms, among them fourteen *schoppietti* 'between good and worn-out' (*fra buoni e tristi*).[16] The militia in Friuli, where Venice bordered Ottoman territory, were equipped with handguns from the 1490s.[17] The first battle of the Italian Wars in which firearms proved decisive (in this case to Spanish victory) was the Battle of Cerignola (1503).[18] With its combination of firearms and disciplined troops, the Spanish army made the running in the use of the new technology; Spanish and German instructors were hired to train the Florentine militia, who were required to drill with firearms from

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[13] Further findings will be presented in a complementary essay on gun proliferation and gun control in sixteenth-century Italy.

[14] Dean, 86.

[15] Gelli, 60, 62. For further background on the use of firearms in fifteenth-century Italy see Mallett, 156-59.

[16] Archivio di Stato di Firenze (hereafter ASF), Otto di Pratica del Principato, 121.

[17] Pepper, 94.

[18] Mallett and Shaw, 64-5.

1508.[19] Skills in firearm use were quickly acquired, however, and the *schioppettieri* in the Duke of Urbino's service in 1505 were predominantly from the surrounding region.[20] Firearms are listed in substantial numbers in the fortresses of the duke of Ferrara in 1509,[21] although that same year Pope Julius II (1443-1513) hired three hundred Swiss *schioppettieri* for his army,[22] suggesting that a case could still be made for importing expertise. Lists of *schioppiettieri* drawn up for the duke of Ferrara in 1521 are dominated by Italian names, not only from the duke's own territories but from Milan, Bergamo and Bologna among other locations.[23] The Battle of Pavia (1525), in which Spanish arquebusiers played a significant role in the defeat and capture of King Francis I of France (1494-1547) is – for its dramatic outcome – often seen as a turning point in the history of firearms.[24] However, so far as the arms industry is concerned one might equally look to the following year: the first archive reference to the involvement of the Beretta family in the arms trade is from 1526, when Bartolomeo Beretta sold 185 gun barrels to the Venetian state for the sum of 296 ducats.[25]

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[19] 'Documenti per servire alla storia', 392, 429, 477. ASF, Nove conservatori di ordinanza e milizia, distribuzione di armi, 1.

[20] Archivio di Stato di Roma, Soldatesche e Galere (hereafter ASR, SG) 86 (Conti straordinari, 1478-1540), ins. 2.

[21] Archivio di Stato di Modena, Archivio Segreto Estense (hereafter ASMo, ASE), Cancelleria Ducale, Archivi militari 267, Libro di munizioni delle fortezze del duca di Ferrara, 1509.

[22] ASR, SG 86 (Conti straordinari, 1478-1540), ins. 3, fols 6r, 30v.

[23] ASMo, ASE, Cancelleria ducale, Archivi militari 269.

[24] Le Gall, 118-27; Sherer, 220.

[25] 'Since 1526'; Sabatti, 165.

The Roman census of the same year documents the presence in the city of an arquebusier named Guillelmo, and two *schioppettieri*, Francisco and Andrea.[26] The attachment of these individuals to those roles was clearly considered sufficient (by them or by the census-taker) to merit specific mention in the records. The 1557 infantry muster rolls from Ferrara suggest that arquebusiers generally accounted for about a third of the infantry and confirm that by this point the personnel involved were primarily Italian.[27] By the end of the century some specialist militia units in Savoy included as many as fifty per cent arquebusiers and a further twenty-five per cent musketeers.[28] As firearms grew in importance as a military technology that necessitated an increase in supply.

Gunmakers

Gun production in Italy was concentrated in Gardone Valtrompia, located in the hills north of Brescia in the Italian Lakes area and for most of this period under Venetian rule. Gardone had an ideal environment for the industry, with easy access to iron mines, to water and wood. In the fifteenth century there seems to have been some import of German firearms technology and migration of technicians into Italy, but the skills were quickly acquired locally. Arms

[26] *Descriptio Urbis*, entry numbers 5525, 5528, 7020.

[27] ASMo, ASE, Cancelleria Ducale, Archivi militari 45. By comparison, a 1571 muster of Spanish troops in the Netherlands included about thirty per cent arquebusiers. Parker, 50, n.11.

[28] Quarenghi, 1:239.

were being exported from Brescia and Gardone from early in the sixteenth century,[29] and Gardone tradition has it that in 1509 Pietro Franzini developed a water-powered mill that enabled quicker and more effective production of arquebus barrels.[30] A Venetian estimate of 1520 placed the population of Valtrompia at fifty thousand.[31] In 1526 the marquis of Mantua – whose request to export gun barrels had been refused by the Brescia rectors – wrote to the Venetian authorities asking for permission to buy two hundred a year.[32] By 1562 Paolo Correr, the Venetian *podestà* in Brescia, estimated that Valtrompia had eight furnaces and forty forges, producing twenty-five thousand *schioppi* for export each year.[33] The demand for wood to produce charcoal and thereby smelt the iron required for gun-making was such that in the previous decade it had caused problematic price increases.[34] By 1572, according to the *relazione* of Girolamo Priuli, Venetian captain in Brescia, Valtrompia had twenty-four

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[29] Quarenghi, 1:149 cites a reference to a Ferrarese purchase of Brescian arms and armour, including *schiopetti* in the 1508 *Cronaca* of Tomasino de' Bianchi; Morin and Held, 24, identify a 1505 reference to Gardone arms production in Archivio di Stato di Venezia, Consiglio dei Dieci, Dispacci Rettori Brescia, busta (hereafter b.) 19, c. 50.

[30] *Antologia gardonese*, 15; Sabatti, 160, n. 26 notes there is no source for this claim but it is repeated in interpretative material at the Museo delle armi e della tradizone armeria, Gardone VT, online at http://www.museodellearmi.net/index.php?section=artigianale&m=percorso&pan=1 [accessed 27 March 2019].

[31] Sabatti, 163, citing Tagliaferri, 3.

[32] Bertolotti, 541.

[33] Tagliaferri, 79-80.

[34] Tagliaferri, 48.

furnaces and two hundred forges and was producing three hundred arquebuses a day (close on a hundred thousand a year) and was 'most famous' for that industry.[35] This was midway through the Fourth Venetian-Ottoman War (1570-73), a likely impetus for the surge in production. Small arms were distinctive in having this heavy concentration of production in one place: the same could not be said of artillery, which was more typically produced in state foundries. Guns, moreover, were not made in a centralised factory. Once the iron ore had been extracted, the supply chain involved a series of micro-businesses: a description of 1609 outlines the roles of different masters, responsible for large and small furnaces, for the barrel's production, drilling, finishing and sanding.[36] Those people in turn depended on the labour of others to supply firewood for smelting and routine supplies of food and drink: the valleys were not self-sufficient and relied on trading their products for food supplies from the plain below.[37] In any case, this was an industry that engaged (directly or indirectly) entire valley communities besides artisans in Brescia itself. Different people might produce the lock, stock and barrel of any individual gun. While the barrels came from Gardone, as Priuli explained, 'the stocks are then made in Brescia, Milan, and other places where the barrels are taken'; he made use of the export licensing system to limit the export of barrels in favour of completed guns, giving Brescian stock-makers a competitive advantage over rivals.[38]

The gunmakers of Valtrompia were well aware of their value to the Venetian state, and worked collectively in negotiations with the Venetian representatives in Brescia to

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[35] Tagliaferri, 117.

[36] Bolognini, 16-19; Morin, 70-71.

[37] Sabatti, 165, citing the 1527 relation to the Senate of Antonio Tiepolo, *podestà* of Brescia, in Tagliaferri, 16-17.

[38] 'Relazione di Domenico Priuli', in Tagliaferri, 115-50 (quotation at at 117).

confirm their historic tax privileges and negotiate exemptions (for example) from militia drills.[39] This was not solely a consequence of their military importance: Brescian *comuni* had been conceded a certain level of autonomy following the establishment of Venetian rule in 1426,[40] and had played an important role in resisting the French invasion in the 1510s.[41] On the other hand, the community's autonomy sometimes proved a headache for the Venetian officials, not least when religious radicalism took hold and in 1553 the rector Cattarino Zen wrote with evident frustration that: 'Everyone carries an arquebus and … they're not content with one, but even the women carry two, one in their hand and the other in their belt, both wheellocks, and they're a bad breed, untameable overbearing Lutherans.'[42]

The Valtrompia gunmakers' role in production, however, undoubtedly gave them leverage. Venice needed the weapons they could supply, but in order to maintain that capacity between conflicts it had to permit exports.[43] During the 1540s, Milan, Spain, the Papal States and England all purchased Gardone weapons. In 1547, for example, the Papal States obtained a licence to purchase 3,000 arquebuses, although as we will see this did not

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[39] For examples of the privileges see ASBs, Canc. pref. inf., Reg. ducali 1, fols. 91-92r; 103r; 146v; 202r-v; 205r-v.

[40] Ferraro, 32; Montanari, esp. pt. 2, chap. 2, 'Valcamonica. Una valle alle frontiere di San Marco', 161-83.

[41] Sabatti, 160. Pepper.

[42] Morin and Held, 44, citing ASV, Collegio, Relazioni, b. 37, fol. 4rv, published in Tagliaferri, 40-41.

[43] For the continuation of this problem into the seventeenth century see Mocarelli and Ongaro.

guarantee that supplies would be available.[44] As early as 1505 Venetian officials had been concerned by reports that certain Gardone masters were leaving Venetian territory,[45] and the problem persisted. By 1545 the Sienese authorities were purchasing 'Archibusi di Lucca', strongly suggesting that production had been established there.[46] The Venetians tried to prevent poaching of their artisans, refusing permission to Battista Riccabello in 1548 to take *diversi maestri* (various masters) to Florence, and threatening any who had already left with the confiscation of their goods if they failed to return.[47] There were limits to their power, however: in 1542, Cosimo de' Medici (1519-74), duke of Florence, had attempted to poach Battista del Chino of Brescia, and the duke succeeded in obtaining his services by 1551, when he was engaged to provide Florence with an annual supply of 900 arquebuses and 100 muskets (muskets are a larger firearm).[48] Battista del Chino also supplied hundreds of firearms to Siena following that city's rebellion against imperial rule in 1552.[49] By 1560 Cosimo had further succeeded in headhunting the Brescian master Nicodemo Magnano, who received a five-year contract to produce arquebuses and other ironwork for Cosimo at a factory in the Florentine subject town of Pistoia.[50] While there were gunmakers elsewhere in

[44] ASBs, Canc. pref. inf., Reg. ducali 2, fol. 44v.

[45] Sabatti, 159.

[46] *Documenti inediti*, 579-80.

[47] ASBs, Canc. pref. inf., Reg. ducali, 2, fol. 77v.

[48] Targioni-Tozzetti, 233. ASF, Mediceo del Principato (MdP) 638, fol. 353 (Medici Archive Project [MAP] Doc ID 15371).

[49] *Documenti inediti*, 587-88.

[50] Targioni-Tozzetti, 234.

Italy, Gardone expertise was clearly attractive, not only on the Italian peninsula but for the production of weapons to be exported across Europe.

Middlemen and the process of purchase

Guns, however, did not sell themselves and transactions between the contractor states and producers depended on the work of middlemen. This is often hidden from sources like the 1571 contract cited at the beginning of this chapter, but becomes evident with a closer reading of account books and correspondence. The accounts for the papacy's 1551-52 military campaign for Mirandola (a small duchy situated midway between Ferrara, Mantua and Modena) illustrate their significance in arms purchasing. Some entries show payments to individuals for weapons: for example, 33 gold ducats and 30 bolognini to Jacopo da Como, 'for many arquebuses had from him'.[51] Other entries were more specific: Maestro Fabian dalle Ballestre had 30 gold ducats and 60 bolognini as payment for 24 arquebuses; Nicolo da Prati had 225 gold ducats for 200 arquebuses 'for the use of the army'.[52] While it is not out of the question that these consignments may have come from individual forges – Correr's figures suggest that by 1562 each of the forty Gardone forges was producing an annual average of 625 gun barrels – these quantities suggest it is likely that multiple producers were involved. The accounts also illustrate something of the distribution process. Fabiano dalle Ballestre received 20 gold ducats and 20 bolognini for 17 arquebuses 'which on the orders of

[51] ASR, SG 88 (Conti Straordinari, 1541-52), volume on the Mirandola war; p. 1 of the account book bound into this volume.

[52] ASR, SG 88, volume on the Mirandola war, pp. 2 and 4.

His Excellency went to the Count of Mondoglio'.[53] Arms supply was typically subcontracted to individual captains, who then provided a certain number of arquebusiers with their weapons. For example, on 10 January 1552, Captain Giovanbattista d'Arezzo was paid 260 ducats as a month's wages for 30 cavalrymen armed with arquebuses.[54] In order to ensure their men were adequately armed, commanders might purchase a large consignment of weapons, but in some cases recruits supplied their own guns and were responsible for them. Spanish arquebusiers, at least, received a higher rate of pay than other men-at-arms, but this wage had to cover the cost of their match, powder and shot.[55] The picture is not straightforward, but it is fair to say that small arms were more likely to be regarded as the individual soldier's responsibility than were artillery.

The role of middlemen in the purchasing process is confirmed in a case from 1552, when the Papacy was preparing defences in advance of an imperial army passing through the Papal States on its way north from Naples to Siena. The payments for 15 December include one to a Florentine merchant, Antonio Ubertini (for 1,500 ducats at ten giulios per ducat) for a consignment of 300 arquebuses, 3,000 morions (a type of helmet typically worn by arquebusiers), 400 corsalets (upper body armour), 200 muskets, 3,000 iron pikes and 200 halberds, which the pope had tasked Camillo Orsini, a prominent condottiere, with bringing from Brescia for use in Rome.[56] A rare piece of archive serendipity allows us to pick up the

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[53] ASR, SG 88, volume on the Mirandola war, p. 4.

[54] ASR, SG 88, volume on the Mirandola war, p. 8.

[55] Sherer, 36; Mallett and Shaw, 208.

[56] ASR, SG 88, volume entitled 'Conto delli denari che si spenderanno nelle cose della militia per presidio et securezza dell'Alma Città di Roma per il passaggio che havrà da fare l'essercito Imperiale come si dice per la impresa di Siena', unpaginated entry in *Uscita* for 15

trail of this transaction in Brescia, where it is discussed in the correspondence of Giovanni Battista Porcellaga, a member of a prominent local noble family, who appears to have been acting as agent for another aristocratic family, the Martinengo.[57] In a letter to Orsini dated 24 May 1553, Porcellaga explained that as soon as Giovanni Finardo da Bergamo had arrived (from the context this must be Orsini's agent), he had 'jollied along the arms bosses as much as I could' so that Finardo could bring the weapons to Orsini straight away.[58] It is notable that he refers to the *patroni* collectively: this was evidently not a transaction that could be completed by dealing with a single master. Sources for the precise ways that this group organised are lacking, but it is possible that given the dominance of arms production in the valleys the *comuni* of Valtrompia and Valsabbia effectively functioned as cartels. The significance of the role of middlemen in Brescia and Gardone is borne out by evidence of an agent of another prominent local family, the Gambara, acting to facilitate an arms deal in 1537.[59] Porcellaga, in fact, had acted as middleman for Orsini in another transaction some

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December 1552: 'À messer Antonio Ubertini mercante fiorentino mille Cinquecento di giulij x: per ducato a buon conto delle infrascritte arme che N. S. ha dato carico all'Illustrissimo Signor Camillo Orsino di far venire da Brescia per uso di quest'alma Città di Roma cioè 300 archibugi 3000 Morrioni 400 Corsaletti 200 moschetti 3000 ferri di picche et 200 alabarde.'

[57] Porcellaga was entitled to bear arms in both Brescia and Venice: see ASBs, Canc. pref. inf., Reg. ducali 3, fol. 14v. On the Brescian elite see Ferraro, 33-34.

[58] 'subbito gionto messer Gio: Finardo da Bergomo lo haggio agrezato quanto ho possuto cosi i patroni delle arme à mandarli subbito, et venir lui dreto con esse'. ASBs, Archivio Martinengo dalle Palle, b. 91, fol. 61r.

[59] ASBs, Archivio Storico Civico di Brescia, Archivio Gambara, b. 608, unnumbered account book. See also Stephen Bowd's contribution to this volume.

eighteen months earlier, liaising with the captain of Brescia to request permission for the export of muskets.[60] That, along with his social connections in the patriciate also raises questions about whether these middlemen might have had the influence to exert pressure on the Venetian rectors or even circumvent them. For neither Porcellaga nor the Gambara agent, however, does arms dealing appear to be a regular occupation, rather something that they might pick up on an occasional basis. Palazzo da Fano, an acquaintance of the Florentine exile Ruberto Strozzi, did likewise, securing arms and armour for Strozzi in Brescia during the 1540s, but also finding him copies of madrigals.[61] These cases would fit the broader pattern of generalist agents in the period, and more specifically contemporary diplomatic practice, in which local fixers might play important roles.[62] This stage of the supply chain alone, then, involved a financier (Ubertini), the condottiere Orsini, his agent Giovanni Finardo, the agent in Brescia Giovanni Battista Porcellaga, and a group of '*patroni delle armi*'. The contractor state could not simply rely on supplies being available: it depended on agents to negotiate, lobby and charm.

Once the agents had arranged the purchase, the specifics of the weapons to be provided would be set out in a contract with the Brescian patron, as we saw in the contract of 16 August 1571, and is reflected in other examples, such as the 1546 deal between Pier Luigi Farnese and Venturino del Chino, which likewise specified details relating to production quality and accessories.[63] The attention to detail and insistence on quality is evident, and in

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[60] ASBs, Archivio Martinengo dalle Palle, b. 91, fol. 5v, letter of 4 November 1551.

[61] Blackburn, 30-34.

[62] Cools, Keblusek and Noldus; Fletcher, esp. chaps 2 and 4.

[63] Zanelli; and see above, n. 1. Quarenghi, 1:184 cites Cominazzi but does not provide an archive source for the additional contract text presented.

some cases might be checked in advance via a sample sent from supplier to purchaser: a Florentine inventory of arms from 1554-55 refers to two large arquebuses (literally *archibusi da mura,* which would be fired while rested on a wall) with walnut stocks ‘as a sample of a larger number that is to be produced’.[64]

Porcellaga's role as liaison with the captain of Brescia leads us to the next step of the arms supply chain: the export licensing process, in which contractor states might be either licensor or licensee. As with the Gardone masters' interaction with Brescian officials, tensions between different layers of authority become apparent. Any state purchase of arms required an export licence from the Venetian officials in Brescia. In the case of the 1552/3 transactions the pope had obtained a licence for the export of 3,000 arquebuses in 1547/8, but according to the records of the Venetian rectors in Brescia had only purchased 1,689, so it is possible that Orsini's consignment of a further three hundred guns was to be set against this outstanding allowance.[65] It was common for states and princes to obtain permission for a large export to be divided into smaller transactions undertaken by their captains or their captains’ agents. In July 1532, for example, the Marchese del Guasto obtained permission to export from Brescia 4,000 arquebuses, 4,000 breastplates and 500 muskets for the imperial army, which were transported in sixteen different consignments, the quantities of guns in each ranging from just seven to 464.[66]

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[64] 'per campione di piu somma che si ha a fare.' ASF, Guardaroba Medicea 31, fol. 69.

[65] ASBs, Canc. pref. inf., Reg. ducali 2, fol. 44v, Pontificio Stato, export licence, including list of subsequent separate consignments, 28 February 1547; fol. 46v, Pontificio Stato, export licence, and consignment details (though not for arquebuses) 9 March 1548.

[66] ASBs, Canc. pref. inf., Reg. ducali 1, fols. 184r-v. There may be a seventeenth consignment listed on a damaged part of the MS.

The number of guns supplied to any individual town or captain was often lower than the total number authorised, suggesting there may have been problems of supply, or at least insufficient surplus to make the Venetian authorities confident that exporting was wise. For example, on 20 March 1528, Bartolomeo Mazzoli, an agent of the duke of Milan's ambassador, was licensed to export 150 cannon (columbrina) balls, 200 arquebuses and fifty *some*[67] of steel for the duchy of Milan. However, while Mazzoli got the entire quantity of cannon balls on 21 April, he was restricted to the export of just twenty arquebuses and three *some* of steel; the following day he was permitted to export a further fifty arquebuses; still, this was barely more than a third of the number requested. On an unspecified later date export of a further twenty-eight *some* of steel was permitted, but that still left the steel export short of the total.[68] The context for these limits was a certain anxiety about ensuring adequate supplies for the defence of Venetian territory: while Venice had only limited involvement in the land wars of Italy after its defeat in 1509 at Agnadello it had every reason to be cautious about French ambitions on the peninsula, not to mention the threat from the Ottomans to its territories in the Balkans and eastern Mediterranean. On 8 April 1529, Bartolomeo Parino of Valtrompia received permission from the doge to export two hundred arquebuses to Venice. The doge, however, was clearly displeased when only 154 arrived, and on 14 April wrote back to the rectors demanding 'the largest possible quantity of arquebuses' for Venice, and forbidding exports elsewhere.[69] In August of that year he allowed infantry captains in

[67] The 1612 edition of the *Vocabolario della Crusca* says that strictly speaking a *soma* is the load that may be borne by a beast of burden. Under the metric system *soma* was specified as a hectalitre (10 litres).

[68] ASBs, Canc. pref. inf., Reg. ducali 1, fol. 17r

[69] ASBs, Canc. pref. inf., Reg. ducali 1, fol. 33v.

Venetian service to stock up on arquebuses according to their contract (*condotta*, i.e., their general contract to supply military services) but without a specific permit, 'so that I don't have to write to you [the rectors] about this every day'. Still, he required the rectors to be 'diligent' that the arrangement was not abused, and to apply 'such limitations as seem prudent'.[70] There was a balance to be struck between control and efficiency. When the Viceroy of Sicily was authorised to export 1500 arquebuses in August 1532, the rectors were told to advise him that he could not have any greater quantity.[71]

The context for at least some of this growth in demand for firearms was the decision by the Venetian state to establish arquebus companies in its territories,[72] but this in turn created new bureaucratic challenges for the Brescian authorities. Guns purchased by the *comuni* of Venetian territories for their arquebusiers were exempt from customs duty (*datio*), but as the doge explained in a letter of 3 May 1529, this meant that the rectors had to require security from the *comune* for which the consignment was intended that the order was official, and that the guns were not intended for sale or for any other purpose. They should note on the licence what the buyer was permitted to export, 'so that no fraud ensues'.[73] An earlier letter from the doge authorising one Sanctino de Rhodian (de Rodiano) da Salò to export firearms gives a more detailed illustration of the ways such problems were dealt with. The rectors had apparently prevented Sanctino from exporting firearms, telling him that they were acting on the orders of the Council of Ten. The doge queried this, insisting that if the rectors had such

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[70] ASBs, Canc. pref. inf., Reg. ducali 1, fol. 47v.

[71] ASBs, Canc. pref. inf., Reg. ducali 1, fol. 195v.

[72] Angelucci, 76; Mallett and Hale, 353. On the earlier use of firearms by more irregular Venetian forces see Pepper.

[73] ASBs, Canc. pref. inf., Reg. ducali 1, fol. 43r.

an order they should produce (literally *servar* or serve) it with diligence, but that if not they should permit the export, making sure, however, 'that he will bring the whole [of it] to Venice and nowhere else'. The rectors were not to release the surety without confirmation from the Arsenal that the entire quantity had arrived; they must not allow themselves to be 'deceived and tricked'.[74] Bartolomeo Parino, whom we encountered above exporting 200 guns to Venice was permitted to do so only having provided 'sufficient security' (*sufficiente cautione*).[75] By requiring a financial guarantee, the state could mitigate against the possibility of exports going missing en route, but not without imposing an additional administrative burden.

Delays in authorising exports could cause frustration for purchasers, as is apparent in a letter of 10 May 1554 from Ercole Poeta, an agent of the duke of Ferrara. A Milanese man, whom Poeta met at a local friary, complained that the supply of morions he was meant to be obtaining for Genoa had been held up while the rectors sought confirmation from the Council of Ten in Venice that the export was acceptable.[76] Poeta had other problems. Tasked with purchasing armour in Brescia, rather than guns, he had arrived to find the workshops quite empty (*le boteghe tanto sfornite*). This was due to the fact that in recent days the supplies had all been bought up by 'various merchants, who had taken them out of town' (*diversi mercanti, che le hanno condotte fuori*). Besides the agents purchasing directly on behalf of states, then, there were also private merchants, not restricted by the export licensing regime, quite possibly reselling to commanders and presumably engaging in this trade because it was

[74] ASBs, Canc. pref. inf., Reg. ducali 1, fol. 29r.

[75] ASBs, Canc. pref. inf., Reg. ducali 1, fol. 33v.

[76] ASMo, ASE, Camera, Amministrazione della casa, Armeria, b. 1, carteggio diverso, unnumbered letter.

profitable. The silence of the state records on the activity of these merchants poses significant problems for a thorough analysis of arms transactions in this period.

An export licence alone, moreover, was often not sufficient: permission was also required for transit of arms consignments through third party states which necessitated further diplomacy. In the 1571 Papal States-Brescia case, the guns were to be delivered to Ancona by the makers, and the contract provided for the possibility of delays in transit via Mantua or Ferrara.[77] Examples of transit licences may be found in the Mantuan archives: on 31 January 1543, for example, Captain Belantonio Corso was granted an exemption from the customs duty in respect of a 'certain quantity of arms and armour' to be brought from Brescia for Pier Luigi Farnese; they also survive in Florence, where in 1552 the Sienese authorities requested a similar transit permit for Brescian arquebuses.[78] There were, however, ways around the licensing system. In 1531, a warrant was issued for the arrest of two former Brescian constables (one responsible for the gate of San Nazaro and the other for the gate of San Giovanni), who along with a local shop-owner and the wife or son of one of the constables, had been allowing a variety of contraband goods, including not only guns but also wheat, to be smuggled out of the city.[79] Local constables and captains were another significant group of actors in the course of any arms sale, and their trustworthiness or otherwise was a key factor in the state's ability to regulate arms exports. The authorities, therefore, faced a tricky challenge in balancing the efficient internal distribution of arms with their control and monitoring, while simultaneously authorizing sufficient foreign exports to maintain capacity.

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[77] Zanelli.

[78] Bertolotti, 584. ASF, MdP 1850, fol. 612 (MAP Doc ID 20156).

[79] ASBs, Canc. pref. inf., Reg. ducali 1, fols. 150v-151r.

Transport, distribution and monitoring

Once weapons had been purchased, they had to be transported, which required further contracting. The account book for the papal fortresses, 1541-42, illustrates a variety of payments for the transport of goods, for example to 'Morgante porter for the transport of the said arquebuses from the Ripa customshouse to the barge', incidentally revealing the involvement of customs officials in the process.[80] It also shows the book-keeper's expenses for going to Paliano and returning with two horses and two servants (literally, *boche* or 'mouths') on the orders of the Treasurer to take these munitions to the Rocca. There are further payments for carts, in one case eighteen of them. An account of the distribution of arms to communities in the Papal States in 1549 includes payments to muleteers, for carts, and for other unspecified transport as well as for paperwork such as a licence.[81] While the 1571 contract specified that transport to Ancona was the responsibility of the producer, other documentation from Rome suggests this was not invariably the case.

Considerable administrative effort went into managing the transport process. Guns were valuable, and a threat to public order in the wrong hands. A bill from 1575 for 591 boxes of various arms dispatched from Brescia to Ferrara, including 9,300 arquebuses, shows that each box was numbered.[82] These inventory numbers were subsequently used for reference during the transport process, with notes taken of who had custody of which

[80] ASR, SG 646 (Miscellanea di carte sciolte) 1541-42 account book for papal fortresses.

[81] ASR, SG 88, insert 3, 'Armi distribuite e vendute alle comunità Stato Ecclesiastico nel 1550'.

[82] ASR, SG 90, unnumbered insert.

numbered boxes.[83] This was not a system unique to Brescia: inventory numbering is apparent in the Ferrarese arms records too.[84] Moving a 1575 consignment from Pesaro to Ancona alone involved an official at each end of the chain, and payments to a number of different bargemen, some of whom made more than one trip. Giovanni Matteo Bruciaferro took forty-eight boxes of arms and armour on his barge on 4 May 1575, and payment is documented both to the bargeman and the porters for unloading and carrying. On the same day Giovanni dal Cesenatico took twelve boxes in his barge and Gironimo Rossi of Chioggia took thirty. On 5 May Bastiano Sbisa took fifty boxes; on the 7th Gaspar Fabbri of Pesaro took forty and on the 8th Terentio Bruciaferro (perhaps a relative of Giovanni Matteo) took a hundred. Almost a week later, on 14 May, Alessandro Ferrarese took fifty boxes and Gironimo Fornaro took sixteen. It is possible that this Gironimo is the same bargeman who transported twelve boxes on 4 May; Alessandro Ferrarese also did a second trip, moving thirty-four boxes on 18 May. Later in the year, on 20 August, Alessandro Ferrarese took another 172 boxes, a further seventy-nine on the 29th and another seventy-two on 1 September. On 11 September he moved seventy, on 1 October another seventy, on 22 October seventy-eight, on 26 October fifty-five and forty-three on 22 November. There are different ways to interpret this change of pattern: it may be that a large initial consignment was divided between whoever could be contracted at short notice, but that subsequently one barge operator became the preferred provider; on the other hand, it is possible that in the autumn one operator took responsibility for the contract as a whole but then sub-contracted sections. Once again this

[83] ASR, SG 4, insert 3, 'Conto d'arme ricevute e distribuite alle battaglie di Nostro Signore de la Reverenda Camera 1575'.

[84] See for example the 1544 inventories of fortresses in ASMo, ASE, Cancelleria ducale, Archivi Militari 271.

stage of the arms supply process points to the number of people involved: not only those at either end of the supply chain but the bargemen and porters, plus whoever made the boxes in the first place and the notary Andrea Martini who eventually audited the accounts. For weapons to be effective, the logistics were vital.

The next step in the chain was distribution. In the Papal States local *massari* (town captains) were responsible for purchase of weapons on behalf of their communities and then their issue. Along similar lines to the arrangements made for the distribution of firearms to the arquebus companies in the Veneto, in 1550, each commune received (and was required to pay for) arquebuses, pikes and halberds. Toscanella got fifteen arquebuses, as did Corneto; Civitavecchia on the coast got twenty, as did Tolfa; Bolsena thirteen, San Lorenzo fifteen again, Acquapendente twenty-five, Orte fourteen and so on.[85] Lists produced in Florence and Ferrara during times of siege (or feared siege) show the process of monitoring who received firearms and other weapons from central supplies (or already had their own).[86] The prospect that supplies might disappear or be removed from stores weighed on the minds of rulers. In May 1531, following the smuggling incident in Brescia, the doge of Venice ordered that inventory be taken of supplies in all the castles and fortresses of the Brescian territory, recording the quality, quantity, number, weight and measure of everything present, 'so that no-one can commit fraud in any part of the aforesaid stores'. The three keys for the castle grain stores in Brescia were to be held by the city captain, the castellan, and a trusted servant

[85] ASR, SG 88, insert 3, fol. 26.

[86] ASF, Otto di Pratica del Principato, 121. ASMo, Archivio Segreto Estense, Camera, Amministrazione della casa, Armeria, b. 1, reg. 5 1552, 'Nota delle persone che dicono sono provviste delle armi a loro tassate'.

of the doge.[87] While the explicit concern here was about grain, missing guns were certainly a problem. A 1558 inventory of the fortress at Perugia included a list of 'everything that isn't in the armoury'. Among the missing objects were six arquebuses. In some instances, the record-keeper recorded that the missing items had been given out, but in other cases he appears to have been ignorant of the stock's fate.[88] While careful record-keeping could not prevent the loss of firearms, it is evidence for the level of attention accorded to monitoring weapons supply and distribution.

Ancillary services

A wide variety of ancillary roles also attached to firearms production. Guns came with accessories: armour adapted for arquebuses (made by armourers), holsters (by cloth and leather-workers), ramrods and moulds for producing shot (smiths and metalworkers). The records refer to ropemakers (Rome), maintainers/repairers (*acconciatori*, Florence), scrap metal merchants (Rome), recyclers of old guns (Bologna), and flask-makers (Brescia). Morions were also produced in Brescia, as we saw with the Poeta order mentioned above. There were gunpowder factories in Venice, Padua and Brescia.[89] Export licences issued in Brescia frequently include alongside guns reference to both powder-flasks and the smaller priming-flasks (used to measure the appropriate dose of powder for the weapon) as well as the helmets and breastplates (*morioni* and *celate*) typically worn by arquebusiers. When the

[87] ASBs, Canc. pref. inf., Reg. ducali 1, fols. 161r-v.

[88] ASR, SG 4, inventory of the fortress at Perugia, unpaginated.

[89] Panciera, 106.

papacy purchased arquebuses in 1575 they also accounted for both sizes of flask.[90] Matchlock arquebuses, moreover, required supplies of match cord, which was purchased sometimes from people specifically identified as rope-makers, such as 'Federicho funaro in borgho', who supplied 163 pounds of hemp for the fortress of Paliano in 1541-42.[91] On other occasions, however, hemp was purchased from merchants or indeed from other states. For example, in 1538 during preparations for a naval campaign against the Ottomans to depart from the Dalmatian port of Zara (now Zadar, Croatia) the papacy purchased hemp from two prominent Venetian patricians: 340 *libbre* from the Magnifico Messer Paulo Giustiniano, provveditore, and a further 140 *libbre* for the production of arquebus cord from the Magnifico Messer Alessandro Contarino.[92] As with the arms purchases in Brescia that were facilitated by local noblemen so when the papacy was preparing a joint armada to depart from Venetian territory it made sense to allow the allies on the spot to arrange supplies; there may also have been political considerations in the choice of supplier. Besides match-cord, the records detail a range of purchases of ironwork, including in 1541 from two Jewish *ferrari* in Rome, Abramo and Iosepho.[93] Iosepho supplied mattocks and pickaxes,[94] the type of tools that could have been used to dig the earthworks often used in combination with firearms

[90] ASR, SG 646 (Miscellanea di carte sciolte), unpaginated accounts for 1575.

[91] ASR, SG 646 (1541-42 account book for papal fortresses), fol. 9v.

[92] ASR, SG 87, 'Conto di riscossioni e pagamenti per l'armata di S. S., 1538-39', fols. 50r, 54r.

[93] ASR, SG 88 (Conti Straordinari, 1541-52), ins. 7 (Guerra di Paliano), p. xl.

[94] ASR, SG 88 (Conti Straordinari, 1541-52), ins. 7, p. 41.

during battle. Another Jewish supplier, Salamon, provided 'a used cauldron of 56 1/2 pounds ... for munitions', possibly an unredeemed pawn.[95]

The maintenance of firearms also required labour. In a 1549 account of artillery in the Rocca at Carpi there were thirty-eight large arquebuses 'unhappy, in poor order' (*infelizi, male in ordine*) and only seven 'good and well in order' (*beli et ben in ordine*); another undated note in the same file recorded the state of arquebuses in various fortresses, noting that water damage had 'ruined' all the arquebuses in Modena.[96] A payment of 1529 by the Florentine *Nove conservatori di ordinanza e milizia* included the cost of powder and shot but also of '*achoncare*' or 'fixing up' arquebuses.[97] While Roberts may be correct that firearms were 'forcing the soldier to be a primitive technician'[98] the existence of private maintenance contractors a century prior to his main case-study prompts questions about how much maintenance was expected from an individual soldier and how much might be contracted out. A reference to cleaning of halberds in the Rome records includes a rare mention of a woman involved in the arms trade: on 9 August 1549 two ducats were paid for this purpose to 'Madonna Elizabetta, the wife of Maestro Angiolo, a swordsmith'.[99] It seems equally

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[95] ASR, SG 646 (1541-42 account book for papal fortresses), 18r. On pawning see the Introduction to this volume, above xx-xx.

[96] ASMo, ASE, Cancelleria, Archivi Militari, 139, unnumbered 'Relacione delle municioni da Guerra'.

[97] ASF, Nove conservatori di ordinanza e milizia, Entrata e uscita/Debitori e creditori, 19, p. 44.

[98] Roberts, 15.

[99] ASR, SG 88, ins. 3, 'Armi distribuite', fol. 12v. 'Madonna Elisabetta Donna di Maestro Angiolo spadaro che haveva netto piu Alabarde che si distribuirno alle Comunita'.

plausible that cleaning of guns might have been sub-contracted, and indeed that many of the payments to men found in the records will also incorporate work done by women. Whether there was modification of arquebuses beyond the basics of maintenance is another outstanding question, but this certainly happened in the civilian context (often to facilitate concealment of weapons)[100] and it is quite possible that soldiers also attempted to improve their own kit. In short, the use of firearms generated demand for a wide variety of goods and services, some specific to guns (repairs and modifications) and some of general commodities which had other civilian uses (provision of hemp for processing into match-cord). The involvement of ropemakers, ironmongers and scrap metal dealers in the broader arms supply process raises important questions about producers' choices. Did they make a conscious decision to turn towards military supply in the hope of profit? Were they obliged—officially or in practice—to supply the state? The sources at hand do not permit a clear answer: rather they highlight the shifting pattern of demand during wartime and the need for states to find supplies to match.

Conclusion

The picture of handgun supply that emerges from the archive sources is one of complexity. It involved numerous transactions: raw materials had to be purchased for the gun mill, the stock and lock added to the barrel of the weapon, and suitable accessories obtained. The Brescian *patroni dell'armi* then dealt with local fixers, with customs officials, with the city rectors and

[100] Archivio di Stato di Bologna, Legato, Bandi 1, fols. 242v-243r, bando of 16 October 1555: 'alcuni hanno trovato modo d'usare gli Archibugietti piccioli, senza Ruota, portandoli coperti in diversi modi'.

via them the Venetian state and third-party state actors. A purchasing condottiere might himself employ an agent; one or both of them would deal with the treasurer of the state for whom the condottiere worked. Transport staff were required to assist with distribution, and officials to manage the final distribution to militia or armies; clerks and auditors ensured this purchase was monitored along the way. Ropemakers, gunpowder suppliers, holster-makers and scrap metal merchants contributed supplies; maintenance staff assisted with repairs. It would not be exceptional to find twenty-odd different steps involved in getting a gun from raw materials to end user. Many of these steps are found in other supply chains of the period, but the specialist nature of gun barrel production combined with the need to safeguard supplies in the interests of defence and public order, made the management of this one an unusually charged matter. On the production side, the role of the state here was primarily one of manager and regulator of private contracting, but this required a high degree of bureaucracy to be effective. It is here as much as in the tax-raising process that we might look for a 'military state'. The state's interactions with its citizens and subjects were not only about extracting money, nor issuing contracts, but about creating and monitoring a system in which multiple actors could each play their part in the state's defence.

However, informal processes were also significant. The state's ability to purchase effectively depended on local patrons and connections, and at times profiteering merchants seem to have taken advantage of state weakness. The private firms involved in arms production used their leverage to extract and maintain concessions and privileges from the state. Along the supply chain for firearms, there are places (as in the monitoring of transport and arms distribution) where the state seems to have been relatively strong. Elsewhere, it seems barely present. Elsewhere still, it is present, but circumvented by corrupt officials or profiteers. Each of the multiple actors involved had distinct interests. Some, like the Valtrompia producers, had reason to co-operate. Others, like the Venetian rectors,

approached transactions with suspicion. In short, what emerges in the military context is a picture of patchy and uneven development of state control of firearms supply, combined with a substantial element of private contracting that functioned on an international scale. In attempting to understand the 'military revolution' in early modern Europe, Clifford Rogers borrowed from discussions of evolution the concept of 'punctuated equilibrium', proposing that this revolution did not flow smoothly, but combined long-term change with period of more urgent development.[101] The study of firearms supply points to the importance of considering this process of change not only across time but also space. At any given point along the supply chain for weapons the military state might be at different stages of development, its success in contracting dependent on multiple variables.

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