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Game of Thrones : a study on war participation

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Juego de Tronos:

Un estudio sobre la participación en la guerra

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Resumen

La Revolución Militar generó un aumento creciente en el costo de las guerras en Europa a partir de 1500. Los reinos debieron gastar una mayor proporción de sus ingresos en asuntos militares, muchas veces a costa del beneficio del mismo reino y disparando conflictos internos. El descontento general podría entonces haber sido usado por los enemigos del rey para obtener el poder, muchas veces escondiéndose detrás de sus parientes más cercanos: los hermanos del rey. Usando datos genealógicos y militares, estudio la importancia empírica de la presencia de hermanos en la decisión de ir a la guerra en la Europa de la temprana Edad Moderna. También pongo a prueba el efecto del género del monarca en el conflicto cuando se tiene en cuenta el número de hermanos.

Palabras clave: Revolución Militar, guerra, competencia, hermanos

"Game of Thrones: A study on war participation"

Abstract

The Military Revolution made wars in Europe increasingly costly after 1500. Kingdoms had to spend greater amounts of their revenues on military affairs, sometimes neglecting the welfare of the realm and triggering internal conflict. Discontent could then be used by enemies of the ruler to take power, most of the time hiding behind one of the ruler's closest relatives: brothers. Using genealogical and military data, I study the empirical importance of the presence of brothers in the decision to go to war in early modern Europe. I also test the effect of the monarch's gender in conflict when the number of siblings is taken into account.

Keywords: Military Revolution, war, competition, brothers

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Abstract

The Military Revolution made wars in Europe increasingly costly after 1500. Kingdoms had to spend greater amounts of their revenues on military affairs, sometimes neglecting the welfare of the realm and triggering internal conflict. Discontent could then be used by enemies of the ruler to take power, most of the time hiding behind one of the ruler's closest relatives: brothers. Using genealogical and military data, I study the empirical importance of the presence of brothers in the decision to go to war in early modern Europe. I also test the effect of the monarch's gender in conflict when the number of siblings is taken into account.

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1 Introduction

The Gaucho Martín Fierro, one of Argentina's most famous books, reads "Let brothers be united as that is the first law"[1]. This doesn't seem to be the case with rulers and their siblings. History is full of examples of how deadly the love of a brother can be when it comes to get a crown: Attila and his brother Bleda tried to kill each other to gain the solitary control of the Huns, while more than a thousand years later Elizabeth I of England lived in fear of being executed by her sister Mary, and princess Sophia plotted against her brother Peter in Russia.

This sickly bond led to permanent suspicion between royal brothers and sisters, who lived in fear of an imminent attack. The continuous court intrigues made kings and queens spend time, money and men to unveil the plots against them and to keep traitors within the noble family away in order to survive. A study on European monarchies from AD 600 to 1800 made by Eisner (2011) shows how deadly family could be for rulers. During this timeframe, an astonishing 8 percent of monarchs were murdered by a close relative to take their place as ruler.

A king could consider himself lucky if Nature gave him no siblings or killed them in an accident or due to an illness[2]. If that was the case, the king could direct all his energy and resources to his most beloved activity: war. Warfare was the main purpose of all the European states that survived the Middle Ages and was considered a luxury good for princes (Voigtländer & Voth, 2013). Machiavelli could not make it clearer when writing "A prince, therefore, ought to have no object, thought, or profession but war."[3] Empirically, it's easy to see this obsession: some 40 to 80 percent of a kingdom's budget went directly to pay for navies and armies before 1800 (Hoffman, 2012).

This amazing spending on warfare had consequences on countries. Hoffman links warfare with technology, arguing that the most violent states improved their technology faster. Besley and Persson (2009) show empirically that countries with a belligerent past have greater fiscal capacity today, whereas Gennaioli and Voth (2015) assert that frequent

[1]Hernández, José. 1834-1886. *Martin Fierro*, chapter 32, verse 17.

[2]Throughout this paper I will speak of 'kings' rather than 'queens' as more than 90% of the rulers in the database are men. See Table A.1 in the Appendix.

[3]Machiavelli, Niccolo, and James B. Atkinson. 2008. *The prince*. Indianapolis: Hackett Pub. Co. page 247.

warfare lead to more state-building. All these results are intimately related to the Military Revolution: the introduction of gunpowder and standing armies and navies turned money into the prime determinant of military success. The wealthiest state would have access to the best military technology, mercenaries and fortifications. Therefore, sources of government revenue were developed to draw large sums of money from the population (Bean, 1973; Gennaioli and Voth, 2015). Understanding the reasons of war participation could then give us hints of current differences between countries.

A vast literature addresses the possible reasons in this era where wars weren't a common-interest public good but an activity desired by kings (Hoffman, 2012). Contest theory gives us different models to endogenize the decisions about going to war and military spending (Corchón and Marco, 2016; Kimbrough et al., 2017). Hoffman (2012) and Gennaioli and Voth (2015) make use of this literature and present variants of a winner-take-all tournament. The former shows the technology improvement of an aggressive state, whereas the latter shows that war is most likely to arise if financial resources influence military success either to a great extent, or hardly at all.

Other authors focus instead on the resources used to ensure internal safety. Egorov and Sonin (2011) present a model of a ruler threatened by internal enemies who has to spend money on loyal or competent counselors to protect himself. They show that he will hire able counselors only when he has offspring, as heirs enlarge his time horizon ensuring internal stability.

Instability can be seen from the outside. Governments in trouble tend to postpone war if internal tensions are so acute that they raise doubts on the loyalty of critical segments. Mayer (1969) argues that a rival king can perceive this weakness and will attack to seize the opportunity. Data from the nineteenth and twentieth centuries refutes his hypothesis. It is possible that the rebuttal comes from using data of democracies: democracies work different than autocracies, as Levy (1988) points out in his thorough literature review on war participation. Regular people organize riots in democracies, whilst in monarchies the royal family is often behind a coup attempt. Differences between the two political systems are further characterized by Chiozza and Goemans (2004), Debs and Goemans (2010), and Weeks (2012).

A recent empirical study by Benzell and Cooke (2021) focus on the effect of family ties

on conflict. Using network analysis, they find that decreases in connection caused by apolitical deaths of rulers' mutual relatives increase the frequency and duration of war.

My paper is closely related to Dube and Harish (2017), that links war participation with gender. They find that female rulers in Europe over 1480-1913 participated more in inter-state wars relative to reigns governed my males. The authors also mention two facts and their possible explanations: while single, a queen was exposed to suffer attacks as she was perceived as weak. Once married, a queen was more prone to engage in wars as aggressor, and this could be thanks to the financial support of her husband.

Although Dube and Harish hypothesis is plausible, there is another possible explanation for these results. In early modern Europe women only reached power as queens when there wasn't any male heir. That is, a queen didn't have close relatives that could try to steal her throne, or at least no male relatives. As she didn't have to worry for internal stability, she could have engaged in more conflicts as an aggressor. In this paper I test the hypothesis that war participation is not directly related with gender, but with the number of competitors for the crown instead. That is, the number of brothers. The fact that women attack more than men could be a consequence of the lack of brothers.

To test this hypothesis empirically, I use Dube and Harish database and data on royal families using Tompsett's directory of royal genealogical data (1994) over 1480-1913. I add the number of siblings by year, separating gender and legitimacy. I also add a variable indicating in which years a king was married, instead of using Dube and Harish's variable that signals if the king was ever married.

With the database thereby complete, a simple regression would not be enough to find a causal effect of the number of alive brothers on conflict if the monarch can endogenously affect this number –for example, through fratricide. I therefore use two exogenous sources of variation in the number of brothers of a monarch: the gender of the firstborn of the previous monarch, and a dummy that indicates if the previous ruler had a sister. I also test if the effect of the gender of the ruler on conflict persists once I control for the number of brothers, sisters, and alive sons of a monarch. I therefore seek to provide identification-based evidence about the effect of the royal family on history (Nunn, 2009).

2 Data description

To test the hypothesis about the negative effect brothers have on war participation, I use the military and genealogical panel data constructed by Dube and Harish (2017) to ensure comparability between the studies. I also focus on the same period: 1480-1913. Reliable data on wars is available from 1480 onwards, and 1913 is assumed to be the last year monarchs had power deciding when their polities should go to war.

There is one important difference with respect to Dube and Harish. While they split their panel in two, showing the main results only for those polities that had a queen at some moment of their history, I don't make such distinction. This results in a panel of 310 reigns across 35 polities, where republics have been dropped since my goal is to study the effect of brothers on absolutists regimes. The appendix lists other differences with Dube and Harish panel, as well as summary statistics of key variables in Table A.2.

2.1 Genealogical Data

Morby (1989) lists kingdoms and their rulers in Europe for the period under analysis. The definition of kingdom that he uses is quite wide: he gathers together actual kingdoms (such as the Kingdom of England, the Kingdom of Denmark, and the Tsardom of Russia) with independent states (such as the Medici in Florence and the Principality of Monaco). As Dube and Harish do, I will not differentiate between each type of political entity to facilitate the comparison of the results.

However, to be able to test my hypothesis I have to add family-related variables to the original dataset. For each monarch, I gather genealogical information from the Catalog of Royal Family Lineages (Tompsett, 1994). I collected data on the number of siblings and children, marriage year, marriage dissolution year, and spouse and siblings' death years. Where no information is available, I complement with the English version of Wikipedia, a source used by Eisner (2011) to study patterns of regicide. With this data, I can generate a variable that specifies the number of living brothers and sisters, both legitimate and illegitimate, of a king in each year of his reign. Besides, I generate a dummy that indicates if at the beginning of the reign of a monarch there is at least one alive brother of the

previous monarch.

While Dube and Harish generate a measure of marriage that is equal to 1 if the partner of the monarch was alive during any year of his reign, I take a different strategy: Following Benzell and Cooke (2021), I consider that a married king is different from his single self so I split the reign of a ruler following his marital status. This allows me to track periods of different alliances. When a king became widowed, it was possible that he would marry again to form a new alliance with another kingdom.

2.2 War data

Data on war participation is obtained from Wright (1942). He lists larger wars, described as "all hostilities involving members of the family nations (...) which were recognized as states of war in the legal sense or which involved over 50,000 troops" and some small wars, described as "hostilities of considerable but lesser magnitude, not recognized at the time as legal states of war, that led to important legal results" (Wright, 1942, p. 636). He also tracks the date each kingdom enters and exits each war, and specifies which kingdoms started hostilities.

Conflicts are also classified by type. Balance-of-Power wars are conflicts among state members of the modern family of nations; Civil wars are conflicts within a state; Defensive wars are conflicts between a state trying to defend modern civilization against an alien culture (that is, the Ottoman empire); and Imperial wars, which are colonial conflicts (Wright, 1942, p. 641). I do not make use of this distinction to avoid the potential bias in his classification.

What I indeed use is Wright's aggressor coding, that indicates which polity initiated a war. This classification allows me to test if monarchs with a smaller amount of living brothers initiated more wars than those with a large quantity of brothers.

3 Empirical Strategy

It would only make sense for the monarch's brothers to confront him if the succession law benefited them in case of the death or deposing of the king. In practical terms, there

were three possible rules of inheritance: (1) Salic Law, (2) primogeniture, and (3) elective succession (Bogdanor, 1995; Corcos, 2012).

The Salic Law or *Lex Salica* was a Germanic tribal code that excluded females and their descendants from the throne and that was applied in the kingdoms of France, Belgium, and Sweden among others. If the eldest male heir had no descendants, then the power passed to the nearest male hair in that generation (a brother, for example). Some countries, in particular Netherlands in 1884 and Luxembourg in 1783, modified the system to apply a semi-Salic method of succession: males from any branch of the family inherited the throne in preference to females until all male heirs in all branches were eliminated. At that point, females could be considered as heirs (Corcos, 2012).

Another type of succession was male primogeniture, in which the male sovereign who claims the title by right established that the title will descend through his family, relying on birth order. It did not exclude females absolutely, but gave preference to male hairs. If the male lineage of a heir disappeared, then the eldest daughter of the most recent male sovereign might succeed to the throne. The kingdoms of England, Spain, Denmark, and Scotland, and the Tsardom of Russia are some examples of polities that applied this method.

In the case of elective monarchies, used most notably in the Holy Roman Empire, but also used in the kingdoms of Bohemia, Hungary, and Poland, the ruler was chosen by a reduced group of noblemen; usually the pool of candidates was from the former king's family. This type of succession, also called tanistry, did not allow for female succession.

A different and rare succession rule was succession through marriage, which was applied twice in the Tsardom of Russia favoring Catherine I of Russia as the wife of Peter the Great, and Catherine II as the successor of Peter III. However, these can be considered exceptions rather than a consistent rule.

In the first two rules of inheritance brothers might have high incentives to confront their royal sibling if he still didn't have a son (Salic Law), or if he still didn't have offspring (primogeniture rule). Only in those two scenarios brothers could have hoped to seize the power if they defeated their king-brother. As for the third rule of inheritance, they could organize a coup at any moment and get the crown even if their brother had offspring.

However, in practice the elective succession method most times worked as a mixture of Salic Law and primogeniture rule given that the power remained in the royal family (Corcos, 2012), or was abandoned altogether. This was the case of the kingdoms and Bohemia, that applied the system from 1572 to 1795, and from 1618 and 1740, returning to the primogeniture rule (Monter, 2012).

It is evident then that rules of succession did change over time during the period under study. These changes may have been a response to wars or the availability of male heirs. Using the changes in succession laws to identify the effect of brothers on conflict could then be incorrect. Besides, there is no data source that details which succession law was applied in each polity annually (Dube and Harish, 2020). In consequence, I will control for the number of male heirs of each king as a way to capture the possible change in behavior of the king's brothers once the changes of grabbing power decrease.

The number of sons also is a control for the possible conflict that they can produce. As Corcos mentions, "Indeed, in some situations, too many sons might be a problem, as England's Henry II discovered, when his sons rebelled against him openly" (p. 1600). As for daughters, they would only pose a problem in absence of male heirs, so in general "a royal father could pacify them with some dower lands and marry them off to a royal suitor" (Corcos, p. 1600). Daughters, and also royal sisters, would instead be useful to form alliances with other polities (Corcos, 2012; Benzell and Cooke, 2021). To account of these possible existent alliances, I will control for the number of alive sisters of a king in each year.

3.1 Instrumental Variables Strategy

The potential endogeneity of the number of brothers of a king is yet to be solved. What if the most violent kings would also murder their brothers to eliminate the internal threat? For this reason, I will make use of the gender of the firstborn legitimate child of the previous monarch as an instrument for the number of siblings of a king. As the gender of a baby is exogenously determined by nature, and sex-selective infanticide was not a common phenomenon in Europe over this period (Siegfried, 1986), this variable instrument is plausibly not correlated with the error term and war-related outcomes.

A priori, gender of the firstborn legitimate child can have two possible effects over the number of brothers of the next king: if the firstborn is a boy, then this could decrease the amount of children the king want to have, as he already has one heir. It could also give the king incentives to have more male heirs, conditional on knowing he is able to procreate sons, as "A sovereign did not believe he needed daughters or other female heirs in order to govern a country and pass on his right to rule and preserve his dynasty. He did believe he needed male heirs, including sons to protect his rights as he perceived them" (Corcos, p. 1599).

In order to test if the gender of the monarch still has effect over conflict once we control for the number of brothers, I will use Dube and Harish dummy that signals the presence of a sister among the previous ruling monarch as an instrument for the gender of the current monarch. If the previous monarch had a sister, this increased the chance that the throne could pass to a female ruler.

Therefore, the main specification is:

$$War_{prdy} = \alpha_p + \tau_d + (\widehat{Brothers_{pry}})\delta + (\widehat{Queen_{pr}})\beta + \mathbf{X}'_{pry}\phi + \varepsilon_{prdy} \tag{3.1}$$

where War_{pry} are war-related outcomes in a polity p, reign r, and year y (the polity attacked, was attacked, or was at war); α_p are polity fixed effects; τ_d are decade fixed effects; $\mathbf{X}$ is a vector of controls that vary at the reign level, or at a reign-year level; $(\widehat{Brothers_{pry}})$ is the instrumented indicator of the number of brothers; and $(\widehat{Queen_{pr}})$ is the instrumented indicator of whether a queen is in power during a given reign.

3.2 Control variables

As discussed above, although the number of alive sisters of the monarch a control, the possibility of the monarch marrying his sisters to form alliances with other kingdoms make this variable interesting. For that reason, it will be reported at all the tables.

In all specifications, I control for the number of the king's alive sons per year, since the presence of male heirs could discourage the king's brothers from attempting a coup. Also, the age of accession of the current monarch will control for the possible effects of youth

over conflict. Finally, a dummy indicating if the king is married each year of his reign will control for further alliances with other kingdoms.

The total number of siblings of the previous monarch will be used as a control every time the presence of a sister of a previous monarch is used as an instrument. In this way, the presence of a female sibling will be exogenous to conflict outcomes.

4 Results

Before centering in the IV results, Table 4.1 shows the OLS relationship between the number of alive legitimate brothers of a king and war outcomes. There is a negative and significant relationship between the number of brothers and the likelihood of a king starting a war showed in column 1. The number of royal sisters and the gender of the monarch don't have a significant relationship. As for the likelihood of a kingdom being attacked showed in column 2, siblings don't seem to have a role *a priori*, while queens seem to suffer more attacks. Column 3 shows a negative and weakly significant correlation between brothers and the polity being at war, although in this case the gender of the ruler has a stronger relationship with conflict.

Table 4.1: OLS Results

	Polity Attacked	Polity was Attacked	In War
Variables	(1)	(2)	(3)
Alive Brothers	-0.0233**	0.00479	-0.0185*
	(0.00972)	(0.0119)	(0.0107)
Queen	0.0280	0.0755*	0.104***
	(0.0372)	(0.0420)	(0.0355)
Alive Sisters	0.00822	0.0205	0.0287**
	(0.00960)	(0.0131)	(0.0112)
Observations	6,308	6,308	6,308
R^2	0.229	0.227	0.391
Decade FE	Yes	Yes	Yes
Kingdom FE	Yes	Yes	Yes

NOTE: Standard errors are clustered at the board-reign level (a broad-reign is defined as the group of all the reigns associated with a single ruler).
* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

4.1 First Stage

The OLS estimates can suffer from bias if the most violent rulers also tended to kill their brothers. It is imperative to use a strategy that accounts for this potential endogeneity. I will make use of the gender of the firstborn of the previous ruler as an instrument for the number of alive brothers of a king. Also, I will use the presence of the previous king's sister as an instrument for the gender of the monarch, mimicking Dube and Harish.

Table 4.2 shows the first stage of the two IV specifications: column 1 shows the IV specification without solving for the potential endogeneity of the gender of the ruler, while columns 2 and 3 make use of two instruments to account for the two variables of interest -number of alive brothers, and gender of the ruler.

As it is easily seen, the gender of the firstborn child of the previous monarch is a weak instrument for the number of alive brothers of a king. It would then be incorrect to use this specification to try to understand the effect of brothers on conflict[4]. The second specification using the two instruments is valid, although again neither of the instruments seem to have a very strong relationship with the number of alive brothers of a king. For this reason, in Table 4.4 I will also show the results of the specification where only the endogeneity of the gender of the ruler is accounted for, and the number of siblings is a control. This specification will mimic Dube and Harish one, and for that reason I will make use of their sample to make the results comparable.

[4]The results of this specification are showed in table A.3 of the Appendix.

Table 4.2: First Stages

Variables	Alive Brothers (1)	Alive Brothers (2)	Queen (3)
FBM_{r-1}	0.205	0.259**	-0.133***
	(0.131)	(0.126)	(0.0319)
Sis_{r-1}		0.335*	0.119**
		(0.174)	(0.0458)
Observations	6,308	6,308	6,308
R-squared	0.338	0.383	0.478
Kleibergen-Paap F-Statistic	2.433	3.549	
Decade FE	Yes	Yes	Yes
Kingdom FE	Yes	Yes	Yes

NOTE: Standard errors are clustered at the board-reign level (a broad-reign is defined as the group of all the reigns associated with a single ruler). Control variables: number of the monarch's alive sons (yearly variation), age of accession of the monarch, and a dummy indicating the marriage status of the monarch. In column 1 I also control for the gender of the monarch. In columns 2 and 3, the number of siblings of the previous monarch is added as a control.
* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

4.2 Main Results

Table 4.3 shows the estimates of the main specification presented in equation (3.1). Although the sign of the effects found in the OLS specification remain, the number of brothers aren't significant to explain the propensity of taking part in a conflict in any of the three ways presented. Instead, the gender of the ruler remains significant and big for the propensity of a polity being in war. In fact, the effect of gender is bigger than the one showed in the OLS specification, evidencing a strong downward bias in the effect of gender over conflict.

Table 4.3: IV Results

Variables	Polity Attacked	Polity was Attacked	In War
	(1)	(2)	(3)
Alive Brothers	-0.0349	0.00965	-0.0252
	-0.0781	-0.077	-0.0895
Queen	0.265	0.252	0.517***
	-0.169	-0.17	-0.193
Alive Sisters	0.0206	0.0217	0.0423
	-0.0261	-0.0307	-0.0314
Observations	6,308	6,308	6,308
Instrument	FBM_{r-1}	FBM_{r-1}	FBM_{r-1}
	& Sis_{r-1}	& Sis_{r-1}	& Sis_{r-1}
Decade FE	Yes	Yes	Yes
Kingdom FE	Yes	Yes	Yes

NOTE: Standard errors are clustered at the board-reign level. Control variables: number of the monarch's alive sons, age of accession of the monarch, a dummy indicating the marriage status of the monarch, and the number of siblings of the previous monarch is added as a control.
* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

4.3 Dube and Harish (2021) specification

In the following table I show the estimates of Dube and Harish specification but adding the number of siblings as controls. Note that the number of observations is now 3,585, as I use their sample (kingdoms with a female ruler at some moment of their history) to make the results comparable.

Although the magnitude of the effect of gender in the likelihood to take part in a war (column 3) is almost the same as the one Dube and Harish find (they report a significant effect of 0.388), I find no effect of gender on the likelihood of attacking once I control for the number of siblings (column 1). As for the likelihood of being attacked (column 2), like Dube and Harish I find no effect of gender on the likelihood of being attacked.

Table 4.4: Alive Siblings as Control Variables

Variables	Polity Attacked (1)	Polity was Attacked (2)	In War (3)
Queen	0.190	0.175	0.366***
	(0.126)	(0.108)	(0.131)
Alive Brothers	-0.0229*	0.0185	-0.00440
	(0.0122)	(0.0147)	(0.0136)
Alive Sisters	0.0306**	0.00858	0.0392***
	(0.0146)	(0.0181)	(0.0144)
Observations	3,585	3,585	3,585
Instrument	FBM_{r-1} & Sis_{r-1}	FBM_{r-1} & Sis_{r-1}	FBM_{r-1} & Sis_{r-1}
Decade FE	Yes	Yes	Yes
Kingdom FE	Yes	Yes	Yes

NOTE: Standard errors are clustered at the board-reign level (a broad-reign is defined as the group of all the reigns associated with a single ruler). Control variables: number of the monarch's alive sons, age of accession of the monarch, a dummy indicating the marriage status of the monarch, and the number of siblings of the previous monarch.
* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

4.4 Effect on Internal Stability Measures

It is possible that the influence of brothers could only be found inside a polity. For that reason, Table 4.5 shows the main specification results, but with another set of dependent variables. Neither the number of brothers nor the gender of the ruler seem to have effect over these measures.

Table 4.5: Stability Variables

Variables	Civil War (single policy) (1)	Civil War (multiple policies) (2)	Reign Length (3)	Monarch Killed (4)
Alive Brothers	0.00763	0.0297	-2.867	0.272
	(0.0283)	(0.0495)	(6.626)	(0.204)
Queen	0.0666	0.188	-19.44	0.0923
	(0.0720)	(0.126)	(14.11)	(0.278)
Alive Sisters	0.00945	-0.000445	-0.315	-0.120
	(0.0102)	(0.0165)	(2.233)	(0.0856)
Observations	6,308	6,308	6,308	3,057
Instrument	FBM_{r-1} & Sis_{r-1}	FBM_{r-1} & Sis_{r-1}	FBM_{r-1} & Sis_{r-1}	FBM_{r-1} & Sis_{r-1}
Decade FE	Yes	Yes	Yes	Yes
Kingdom FE	Yes	Yes	Yes	Yes

NOTE: Standard errors are clustered at the board-reign level (a broad-reign is defined as the group of all the reigns associated with a single ruler). Control variables: number of the monarch's alive sons, age of accession of the monarch, a dummy indicating the marriage status of the monarch, and the number of siblings of the previous monarch.
* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

5 Conclusions

Competition among brothers will always exist. This fact makes the presence of brothers an interesting variable to analyze in a setting where family relationships could affect whole countries: European monarchies before the First World War. This paper examines the effect of the number of alive brothers over conflict, both external and internal. Besides, I test whether Dube and Harish results that female rulers are more prone to conflict remains once I control for the number of alive siblings.

I find no evidence that the number of brothers has a role over the likelihood of attacking, being attacked, or take part in a war. Besides, I find no effect of queens over the likelihood of starting a war, in contrast with Dube and Harish who find a positive and significant effect.

These results reject my hypothesis of the direct importance of brother over conflict in the Modern Europe, but also show that the number of siblings is still a crucial control variable.

Dube and Harish's result of queens engaging in more wars as attackers disappears once I control for the number of siblings.

The mechanism of why queens are more prone to be in a war needs then further analysis. Dube and Harish's hypothesis that queens started more wars as they had more resources seems unlikely, given that the effect disappears once siblings are controlled for. Alliances through brothers, sisters, and offspring need to be accounted for: it is possible that queens were in wars more years if they were unable to form alliances with other kingdoms given the relative lack of close relatives, for example.

It would also be ideal to use another instrument to solve for the potential endogeneity of the number of brothers. A possibility I considered was using plagues and famines as an instrument under the hypothesis that they can kill some of the royal brothers. However, this variable has two problems: The first one, and most important one, is that it is not evident that plagues and famines comply with the exclusion restriction. They could directly affect the likelihood of a war –for example, making wars less likely given the lack of human resources to fight. The second problem is that few royal relatives died in these events (Benzell and Cooke, 2021). It could also be possible to use the grade of consanguinity of the parents of the brothers, as more likely to suffer from congenital diseases and die younger (Abbas and Yunis, 2014). However, again this variable may not comply with the exclusion restriction, as the monarch may suffer from the some congenital disease that avoids him to take part in conflicts.

My findings suggest that further analysis of royal family ties is needed to understand war participation in Modern Europe. For now, I can only reach one certain conclusion: siblings matter, at least indirectly, to understand the game of thrones.

A Appendix

Table A.1: Monarchs by Gender

Monarch Gender	Frequency	Percent (%)
Female	28	8.78
Male	291	91.22
Total	184	100

Table A.2: Summary Statistics of Key Variables

Variables	Observations	Mean	Standard Deviation	Minimum	Maximum
Dependant Variables					
In War	6,308	0.294	0.456	0	1
Reign Entered War	6,308	0.237	0.425	0	1
Reign Continued War	6,308	0.057	0.232	0	1
Polity Attacked	6,308	0.132	0.338	0	1
Polity Was Attacked	6,308	0.162	0.369	0	1
Civil War (single policy)	6,308	0.043	0.203	0	1
Civil War (multiple policy)	6,308	0.017	0.131	0	1
Reign Length (years)	6,308	31.086	15.891	1	72
Monarch Killed	3,057	0.145	0.352	0	1
Independent Variables					
Number of Alive Legitimate Brothers	6,308	0.758	1.108	0	6
Numper of Alive Legitimate Sisters	6,308	1.051	1.256	0	7
Alive Legitimate Sons	6,308	1.163	1.517	0	9
Queen	6,308	0.089	0.285	0	1
Married	6,308	0.642	0.479	0	1
Firstborn male (of previous monarchs)	6,308	0.455	0.498	0	1
Sister (of previous monarchs)	6,308	0.678	0.467	0	1
Total Siblings (of previous monarchs)	6,308	3.671	3.813	0	22
Age	6,308	22.990	15.085	0	67

Table A.3: IV Results using only FBM_{r-1} as instrument

Variables	Polity Attacked	Polity was Attacked	In War
	(1)	(2)	(3)
Alive Brothers	-0.121	-0.0846	-0.205
	(0.142)	(0.163)	(0.185)
Queen	-0.0236	0.0281	0.00453
	(0.0836)	(0.0943)	(0.106)
Alive Sisters	0.0385	0.0483	0.0868
	(0.0462)	(0.0542)	(0.0632)
Observations	6,308	6,308	6,308
Instrument	FBM_{r-1}	FBM_{r-1}	FBM_{r-1}
Decade FE	Yes	Yes	Yes
Kingdom FE	Yes	Yes	Yes

NOTE: Standard errors are clustered at the board-reign level. Control variables: number of the monarch's alive sons, age of accession of the monarch, and a dummy indicating the marriage status of the monarch.
* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

Errors Found in Dube and Harish (2021) and Important Notes

- Mary II Stuart died in 1694, not in 1695. I removed that observation, as the data was repeated for her successor.
- Henry III of Navarre, or Henry IV the Great of France was dead in 1610. I removed that observation.
- Ferdinand I Habsburg of Austria died in 1564. I assigned the war data of that year to his successor.
- Frederick Augustus II of Saxony died in 1763. I assigned the war data of that year to his successor, Stanislas II Augustus Poniatowski.
- Frederick Henry, king of Netherlands, was not king until 1635. I remove the observation that was assigned to him in 1625.
- I removed the Kingdom of Montenegro, as there is not enough genealogical data to get the number of siblings.

- I assigned a one to the dummy variable `married` the year the ruler got married. Likewise, I assigned it a zero the year the ruler's spouse died.
- I didn't considered political siblings: I only took into account siblings with some sort of blood tie.
- I decided not to use the data on illegitimate brothers as there was much discrepancy between the number of illegitimate brothers listed in Tompsett's directory and other sources (namely the Encyclopedia Britannica and Wikipedia).

References

[1] Abbas, Hussein A., & Yunis, Khalid (2014), "The effect of consanguinity on neonatal outcomes and health", *Human Heredity*, **77(1-4)**, 87-92.

[2] Bean, Richard (1973), "War and the Birth of the Nation State", *The Journal of Economic History*, **33(1)**, 203-221.

[3] Benzell, Seth G. & Kevin Cooke (2021). "A Network of Thrones: Kinship and Conflict in Europe, 1495–1918", *American Economic Journal: Applied Economics*, **13(3)**, 102-33.

[4] Besley, Timothy & Persson, Torsten (2009), "The Origins of State Capacity: Property Rights, Taxation, and Politics", *American Economic Review*, **99(4)**, 1218-44.

[5] Bogdanor, Vernon (1995). *The monarchy and the constitution*, Oxford University Press on Demand.

[6] Chiozza, Giacomo & Goemans, Hein E. (2004), "International Conflict and the Tenure of Leaders: Is War Still "Ex Post" Inefficient?", *American Journal of Political Science*, **48(3)**, 604-619.

[7] Corchón, Luis & Serena, Marco (2016), "Contest Theory: a Survey", *Handbook of Game Theory and Industrial Organization, Forthcoming.* Available at SSRN: https://ssrn.com/abstract=2811686 or http://dx.doi.org/10.2139/ssrn.2811686

[8] Corcos, Christine Alice (2012), "From Agnatic Succession to Absolute Primogeniture: The Shift to Equal Rights of Succession to Thrones and Titles in the Modern European Constitutional Monarchy", *Michigan State Law Review*, **2012(5)**, 1587-1670.

[9] Debs, Alexandre & Goemans, Hein E. (2010), "Regime Type, the Fate of Leaders, and War", *The American Political Science Review*, **104(3)**, 430-445.

[10] Dube, Oeindrila & Harish, S.P. (2017), "Queens", (Working Paper No. 23337 NBER).

[11] Egorov, Georgy & Sonin, Konstantin (2011), "Dictators and Their Viziers: Endogenizing the Loyalty-Competence Trade-Off", *Journal of the European Economic Association*, **9(5)**, 903-930.

[12] Eisner, Manuel (2011), "Killing Kings: Patterns of Regicide in Europe, AD 600-1800", *The British Journal of Criminology*, **51(3)**, 556-577.

[13] Gennaioli, Nicola & Voth, Hans-Joachim (2015), "State Capacity and Military Conflict", *The Review of Economic Studies*, **82(4)**, 1409-1448.

[14] Hoffman, Philip T. (2012), "Why Was It Europeans Who Conquered the World?", *The Journal of Economic History*, **72(3)**, 601-633.

[15] Kimbrough, Erik, Laughren, Kevin & Sheremeta, Roman M. (2017), "War and Conflict in Economics: Theories, Applications, and Recent Trends", *Journal of Economic Behavior and Organization*, Forthcoming. Available at SSRN: https://ssrn.com/abstract=3005526

[16] Levy, Jack S. (1988), "Domestic Politics and War", *The Journal of Interdisciplinary History*, **18(4)**, 653-673.

[17] Mayer, Arno J. (1969), "Internal Causes and Purposes of War in Europe, 1870-1956: A Research Assignment", *The Journal of Modern History*, **41(3)**, 291-303.

[18] Morby, John E. (1989), *Dynasties of the World: A Chronological and Genealogical Handbook*, Oxford University Press.

[19] Monter, William (2012), *The Rise of Female Kings in Europe, 1300-1800*. New Haven, Yale University Press.

[20] Nunn, Nathan (2009), "The importance of history for economic development", *Annual Review of Economics*, **1(1)**, 65-92.

[21] Siegfried, Michael (1986), "The Skewed Sex Ratio in a Medieval Population: A Reinterpretation", *Social Science History*, **10(2)**, 195–204.

[22] Tompsett, Brian (1994), Directory of Royal Genealogical Data.

[23] Tullock, G. (1980), "Efficient Rent-Seeking," in J.M. Buchanan, R.D. Tollison and G. Tullock (eds.) *Towards a Theory of a Rent-Seeking Society*, Texas A&M University Press, 97-112.

[24] Voigtländer, Nico & Voth, Hans-Joachim (2013), "The Three Horsemen of Riches:

Plague, War, and Urbanization in Early Modern Europe", *The Review of Economic Studies*, **80(2)**, 774-811.

[25] Weeks, Jessica L. (2012), "Strongmen and Straw Men: Authoritarian Regimes and the Initiation of International Conflict", *The American Political Science Review*, **106(2)**, 326-347.

[26] Wright, Quincy (1942), *A Study of War: Volume 1*, The University of Chicago Press.