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## **Business Networks and Social Capital in Basque Industrialization (1886–1925)<sup>1</sup>**

### ***Abstract***

The aim of this article is to analyse the potential role that social capital played in the industrialization of the Basque Country. The province of Gipuzkoa, together with the neighbouring Bizkaia (Biscay), was one of the most dynamic provinces in Spain in terms of the creation of companies. Using information obtained from the registration of new companies in the Mercantile Register, and through social network analysis, we try to measure the importance that social capital may have had in this process. The methodology is tested with the case study of the arms industry in Eibar, one of the most important sectors in the region.

**Keywords:** Business networks; Social capital; Industrialization; Basque Country; Arms industry.

### **Introduction and objectives**

The special characteristics of the industrialization process in Gipuzkoa, in contrast with Bizkaia, are well-known and have been studied for some time in Spanish historiography.

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Gárate (1976, 1995) and Catalan (1990) indicated the importance that the local bourgeoisie had in the industrial development in Gipuzkoa, with family capital predominating and a weak role for the financial sector. They also highlighted the relatively small size of the companies and the enormous industrial diversification, which were no hindrance to achieving a significant degree of innovation and external competitiveness. Recently, Gonzalez Portilla et al. (2015), focusing on the analysis of the Deba Valley, also highlighted the special characteristics of the Gipuzkoan industrialization model, which, concentrated in medium-size cities with scant foreign immigration, gave rise to a territorial and population configuration that differed from the neighbouring Bizkaia.

The dynamism of Gipuzkoan entrepreneurs resulted in the creation of a rich and diverse industrial fabric, with the following industries gaining particular significance: consumer goods (paper, textiles, beer, chocolate, footwear...), processed metal products (arms, machine tools, metal fittings, railroad material), and intermediate goods (iron and steel, cement...). This high degree of activity was led, mainly, by local entrepreneurs who also showed great initiative by expanding industry to new productive sectors, thus contributing to even greater diversification in the province's industrial fabric.

The concept of social capital, although initially used in the field of sociology, has gained certain standing in economic analysis and is considered by some authors to be a determining factor for regional development (Putnam, 1993). Although it has received a multitude of definitions, social capital is composed of a series of shared values, norms, or attitudes that emerge from the existence of social relations among members in a particular community. From an economic point of view, the existence and density of social networks generates a stock of social capital that facilitates cooperation between the agents that form them, as well

as reducing transaction costs and boosting business initiatives. These would not be exclusively limited to the creation of new companies, but could also encompass other spheres such as research, training, or internationalization.<sup>2</sup> One of the main problems associated with social capital is its intangibility, with abundant criticisms received by some of the indicators proposed by Putnam, as well as the active policies promoted to boost its creation.<sup>3</sup>

Throughout this article, we aim to determine the importance that the accumulated social capital in the province may have had in the development of the Gipuzkoan industrialization process. For this, the study approaches the subject from three different perspectives. Firstly, and through the information contained in the Gipuzkoan Mercantile Register (GMR), we analyse the origin and amount of the capital used for the creation of companies in the period 1886–1925. With this, we try to examine the characteristics of the investments made, identifying the most attractive sectors at any given moment, as well as the existence of capital transfers between sectors that reveal potential strategies for vertical or horizontal integration and for productive diversification.

The characteristics of Gipuzkoan industry, which has very few large corporate structures, prevent us from using boards of directors as an instrument for determining the degree of business cohesion in the province. However, the predominance of limited and family partnerships offers us the opportunity to turn to social network analysis (SNA), examining the business links among the people that appear in the GMR as company founders. The second part of our study is based on the fundamental premise that, in this context of companies with a relatively low number of partners, the people that share the business have common interests

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<sup>2</sup> There is abundant literature related to social capital, its definition, and its influence in different areas of economic development. See Etxabe and Valdalisó (2016) for a recent overview of the issue.

<sup>3</sup> See a summary of the critiques of Putnam's approach to social capital and the associated active policies in Urteaga (2013).

and a certain degree of social interaction. Therefore, the conclusions we reach through SNA will be an excellent indicator of the social capital that existed in the period of study. Our hypothesis is that the high level of social capital in the territory is one of the factors that explain Gipuzkoan industrial dynamism, since greater intensity in the social relations between potential investors would have positively impacted on the implementation of new business initiatives.

In the final part of the article, we study the network corresponding to the industrial arms district in Eibar in greater detail. The creation of companies in this area during the period researched presents some particularities that provide us with the opportunity to measure the representativeness of the model used, drawing on the qualitative information available.

### **Methodology and critical assessment of sources**

There is general consensus among business historians when it comes to considering the MR as a relevant source for measuring investment prospects and capital formation in a specific geographic area (Jiménez Araya 1974, 148). In fact, the creation of companies is a great indicator of the entrepreneurial spirit that exists among the members of a community, since it not only demands the prior establishment of a relationship, but also other factors such as recognizing a business opportunity, gauging and trying to solve the possible technical limitations, achieving funding, and, finally, deciding on the organization and workings of the new project (Garrués and Rubio 2011, 10). In this sense, the province of Gipuzkoa was, together with Bizkaia, among the most dynamic provinces in Spain, occupying the top

positions in the creation of public limited companies during the period of study (Jiménez Araya 1974, 164)<sup>4</sup>.

In order to prepare the sample of companies to carry out our analysis, a series of prior constraints were taken into account. Firstly, we only considered companies that were established in the province and that carried out their business there, leaving aside those that spread their business to the rest of the national territory and those that operated in the province, but were established elsewhere. That is, we have treated the Gipuzkoan business fabric as purely endogenous, although obviously this was not the case. Secondly, in order to examine the corporate links as intended, it was necessary to clearly identify the agents involved in them. This is the reason why we have only taken into account those companies that offered unambiguous personal details on their partners, excluding those that were formalized through third parties and that did not specify the identity of their members or the amount of the investment. In this regard, the nominal capital that features in the creation of general or limited partnerships should not be very different to the actual paid in capital. On the other hand, for public limited companies it is difficult to establish what the real investment was since some of them, despite having been on the register, did not manage to become active or paid in only a minimal part of the amount committed to. Moreover, some subsidiaries even included the nominal capital of the parent company on their record, rather than the capital that corresponded to the subsidiary itself (Gárate 2009, 253). For all of these reasons, in the case of public limited companies we have only taken into account those in which the identity of the partners and their nominal contribution appeared. We thus excluded subsidiaries, companies

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<sup>4</sup> There are several authors that have also used the MR as a source to analyse entrepreneurship in the same geographical area. See Valdaliso (1993) and Galarza (1996) for Bizkaia, and Erro (1995, 1997) for Navarre.

that did not specify the involvement of each partner in current pesetas, or companies that clearly formed part of national- or international-level enterprises.

Lastly, we also excluded one-person companies, which, in the Industrial Production Census for 1923–1924, represented 80 per cent of establishments, but contributed only 15.45 per cent of capital.

With these exceptions, we obtained the establishment data of 1025 companies for the period 1886–1926, representing 48 per cent of the total recorded in the GMR for those years. This sample presents considerable balance in terms of representativeness of the different sectors of activity when we compare it to the data provided by the Industrial Statistics of Gipuzkoa for 1915 and the Industrial Production Census for 1923–1924 (Table 1).

**Table 1.** Comparison of the percentage weight of sectors in Gipuzkoa

	<b>GMR Sample 1886–1926</b>	<b>1915</b>	<b>1923–1924</b>
CONSUMER GOODS	36.81	39.17	50.60
PRODUCTION GOODS	57.49	57.85	44.29
ENERGY	5.70	2.98	5.11

*Source:* compiled by authors using the Gipuzkoan Mercantile Register (GMR, Books no. 1–40), the Industrial Statistics of the Province, year 1919, data from the Provincial Council for Development, San Sebastián, 1915 (Castells and Luengo 1988, 260), and the AGG-GAO (General Archive of Gipuzkoa – Gipuzkoako Artxibo OrokoRra), Census of Industrial Production for 1923–24, Section ‘Inventario Topográfico’.

Note: In the calculation of these percentages we did not take into account the services sector since the statistics for 1915 and 1923–1924 only covered industrial sectors.

Once the empirical basis was set, we undertook the process of homogenization of the data, excluding the effects of variations in the membership base, name, or capital of the companies to avoid duplication and, therefore, an upward skew in the investment. Subsequently, the companies were classified according to company purpose following a classic division by sectors: consumer goods (food, textiles, leather, paper, wicker, and umbrellas), production goods (wood, construction material, metallurgy, and iron and steel) mining, chemicals, energy, and services (tourism, hotel trade, entertainment, transport, and financial services).

Due to its special relevance in the sample, the arms industry was considered as a sector in itself, though it could have been included in the group of production goods.

One of the most important factors when it came to processing the data obtained from the GMR was the identification of each individual, a key aspect for establishing the corporate relationships between them. This is no trivial matter. As well as the typical problems of indiscriminate use of b and v or y and i, or transcription errors that could lead to confusion around very common surnames like Echebarria or Echeberria (written with b or with v indiscriminately), there are many double surnames that at times appear in full and at times shortened, such as Arizmendiarieta, which is at times written simply as Arizmendi. On the other hand, in certain valleys in Gipuzkoa, there are surnames that are so common that it is not unusual for different people to share first names and both surnames in the same historical period. And to complicate things further, there is a tradition of baptizing male children so that they share one of their first names (for example, names accompanied by María or José), which means that if the personal information is not complete we may confuse one person with another.

The place of residence can also cause problems, since often the same person appears as a resident of two different places. In these cases, we opted for respecting the first residence assigned since, almost always, the second location tended to correspond to San Sebastián or Madrid, cities of common residence for established business owners. The same thing happens with the professions recorded, given that a single individual can appear in different public documents as trader, owner, or industrialist. Often, the assignment of one profession or another has more to do with the social status reached than with the performance of a specific activity. In this case, we followed a common approach in similar jobs; that is, we gave

preference to one activity over others: industrialist over trader or engineer, and the latter two over owner activity. The nobility were always assigned the category of ‘rentier’ and the different public posts were framed together under ‘administrative personnel’. In the case of the liberal professions, we respected all those activities considered as such today, while under the label of ‘trades’ we included multiple technical professions related to the most diverse sectors. Arms manufacturers were considered as a specific category given that they have their own particular characteristics and business activity.

In order to establish the total amount of capital invested by each individual, we used a very similar approach to that followed with the companies. An aggregate was set considering the value of the initial investment in each of the businesses and the positive differences between this and the successive variations recorded.

All that was left was to identify and quantify shared investment plans, interests, and strategies in certain groups. Social network analysis (SNA) provides a theoretical and methodological framework for identifying the role played by social capital in the consolidation of business structures. Our analysis excludes some variables that could positively skew the generation of social capital in order to focus on a single relationship criterion: the participation of the individuals in more than one company. Our hypothesis is that as the individuals participate in the establishment of a greater number of companies, the social relations linked to that participation increase the stock of social capital in the territory. This accumulated capital fosters entrepreneurship among the individuals that form the overall network and would explain, to a large extent, the economic dynamism of the region.

### **Characteristics of industry financing in Gipuzkoa**

After moving the inland customs to the border and the coast in 1841, the internal Spanish market was opened up to Basque producers and this boosted capital investment. This investment was shared across different sectors, modifying the Gipuzkoan sectoral structure, while the crisis of the traditional iron and steel industry took place (Gárate 1976, 236–261 and Carrión 2010, 80–93). With the implementation of import substitution policy and industrial tariffs at the beginning of the 20<sup>th</sup> century, the establishment of companies and the amount of capital invested increased significantly in Gipuzkoa. As in the rest of Spain, the five years prior to the beginning of the First World War and the first two of the conflict were years of uncertainty before the new international situation, which meant that, despite the increase in the number of companies, the capital deposited decreased to pre-1900 levels. Subsequently, Spanish neutrality and the proximity to the French border favoured innumerable business opportunities that resulted in a genuine investment boom, which was especially intense in the 1920s (Jiménez Araya 1974, 164).

In Gipuzkoa, the new industrial fabric was boosted by capital from the family and social spheres, forming a dense network of family and sectoral relationships. The Great War gave rise to the emergence of industrial sectors that required a type of funding that was more flexible and of a greater volume than what the traditional partnership system could provide. Therefore, these needs were covered by public limited companies, which facilitated 70 per cent of overall investment. In any case, these companies were established on the already existing industrial base and among their shareholders they brought together many of the families that were until then key to the development of the province.

**Table 2.** Geographical origin of investors in Gipuzkoa 1886–1926 (in percentage) \*

	1886–1913		1914–1926		1886–1926	
	No.	% Ptas.	No.	% Ptas.	No.	% Ptas.
Gipuzkoa	48.81	36.01	51.95	36.82	50.48	34.81
San Sebastián	25.60	25.75	24.90	24.91	25.22	25.95
Álava	0.46	0.12	0.58	0.23	0.53	0.18
Bizkaia	5.31	5.23	5.70	5.99	5.52	5.78
Navarra	0.73	0.07	1.51	0.90	1.15	0.53
Madrid	5.04	10.33	3.26	19.85	4.09	15.74
Catalonia	0.33	0.24	1.69	5.67	1.05	3.18
Spain	2.39	1.10	2.56	3.61	2.48	2.49
France	8.49	17.08	2.21	0.74	5.14	8.68
Europe	0.80	0.93	1.75	0.91	1.30	<b>0.94</b>
America	0.07	0.01	0.41	0.09	0.25	<b>0.05</b>
Asia	-	-	0.17	0.03	0.09	<b>0.01</b>
N/S	1.99	3.13	3.32	0.24	2.70	<b>1.65</b>
<b>TOTALS (Investors, and pesetas)</b>	<b>1,508</b>	<b>102,065,145</b>	<b>1,719</b>	<b>113,930,560</b>	<b>3,494</b>	<b>215,995,705</b>

*Source:* Compiled by authors using the GMR, Books 1–40.

\* The total number of investors from 1886–1926 does not coincide with the disaggregated sum of investors for the periods due to the fact that there are people that invested in both periods but in the total calculation they were considered as a single entry.

As we can see in Table 2, the capital necessary for fostering the modernization and diversification of industry in Gipuzkoa was chiefly local (around 60% in the entire period studied), with a greater presence of investors from the overall province over those from the capital. However, and in contrast with Bizkaia, the most noteworthy feature is the strong presence of investors from France and Madrid from the very beginning of industrialization, as well as the limited importance of Spanish-American capital. The French presence was very frequent at the beginning of industrialization with a clear preference for consumer goods industries, primarily textiles. As the paper, cement, wood, or chemical derivatives industries developed, French investment withdrew, although it did not disappear. At the end of the 19<sup>th</sup> century and especially after the First World War, trans-Pyrenees capital, alone or in alliance

with Gipuzkoan capital, began a process of diversification that included factories for chemical, iron and steel, and food products.

The contribution of national capitalism, especially from Madrid, to Gipuzkoan industrialization stands out more so due to the amounts contributed than to the number of investors. Without a doubt, the move of the royal court to San Sebastián during the summer period must have generated significant business opportunities in both directions. Investment from Madrid became more intense after the Great War and was present in all types of activities. It appeared in traditional sectors such as food, paper, or metallurgy, but also in the most innovative sectors such as aeronautics, the automotive industry, or the manufacture of phonographic devices and discs. Likewise, its presence was significant in the development of the financial sector, with the promotion of insurance brokerage firms, local banks, and tourist services. However, the sector where it was most predominant was the publishing business, which absorbed 73.8 % of the capital publically recorded from people residing in the capital.

On the other hand, the presence of Catalan capital, linked mainly to the textile sector, was merely token. However, once the new century began, Catalan investment increased its presence and diversification, backing, for example, the production of new rubber products, investment in financial services, or the promotion of cinematographic entertainment.

Regional investment from the other two Basque provinces and Navarra had, in terms of recorded capital, relative importance. Nevertheless, it is worth highlighting the Bizkaian contribution to the expansion of the iron and steel, energy, and tourism sectors.

When initiatives and investment come primarily from local capital, as is the case in Gipuzkoa, investor occupations acquire considerable relevance. Thus, the analysis of professional activity allows us examine the characteristics of this process of endogenous industrialization.

**Table 3.** Professional activity of investors in Gipuzkoa 1840–1926 (in percentage)

	1886–1913		1914–1926		1886–1926	
	No.	% Ptas.	No.	% Ptas.	No.	% Ptas.
Industrial	14.59	20.22	16.29	26.56	15.88	25.77
Arms	9.35	3.31	10.49	4.82	10.68	4.01
Commercial companies	0.46	2.11	1.28	4.44	1.03	8.73
Engineers	3.85	7.77	3.07	2.45	3.52	3.77
Trades	14.26	6.10	20.75	10.73	16.89	10.80
<b>Industrialist</b>	<b>42.51</b>	<b>39.51</b>	<b>51.88</b>	<b>49.00</b>	<b>48.00</b>	<b>53.08</b>
<b>Trader</b>	16.58	21.94	15.07	9.68	15.37	15.10
<b>Owner</b>	12.33	13.62	4.06	3.44	8.16	7.52
<b>Administration</b>	3.38	2.61	1.74	1.19	2.32	1.49
<b>Rentier</b>	2.92	2.87	2.20	5.41	2.06	4.04
<b>Liberal professional</b>	9.28	6.94	7.42	9.71	9.02	8.82
<b>Banker</b>	0.73	1.81	0.93	2.80	0.31	1.13
<b>Employee</b>	4.11	2.49	9.16	2.40	7.21	2.47
<b>Homemaker</b>	3.98	5.77	4.35	3.91	4.04	3.86
<b>Others</b>	0.20	0.12	0.29	0.38	3.21	0.97
<b>Not specified</b>	3.98	3.31	2.90	12.08	0.31	1.53
<b>TOTALS (Cases and Pesetas)</b>	<b>1,508</b>	<b>102,065,145</b>	<b>1,719</b>	<b>113,930,560</b>	<b>3,494</b>	<b>215,995,705</b>

Source: Compiled by authors using the GMR, Books 1–40.

While in the first phase of industrialization the modernization of manufacturing was made possible thanks to the transfer of fixed preindustrial assets from a steel and iron sector in crisis (Catalán and Mugartegui 2013, 149), in the period between 1886 and 1926 industrialists contributed more than half of the capital recorded. The reinvestment of profits and the diversification of investment portfolios would gradually consolidate throughout the 20<sup>th</sup> century, driven by people with prior experience in industrial investment or who were dedicated to a variety of trades. Adjusters, mechanics, lamp makers-plumbers, engine drivers, engravers, turners, bricklayers, carpenters, marble cutters, canvas sandal makers, or simply factory workers merged to found family, limited, or general partnerships in sectors that they were perfectly familiar with. For this reason, the quantities paid in were not very significant nor did they reach a considerable percentage weight despite the number of partners involved. However, if we group these people according to the sector they are linked to, we can gain a

more precise picture of the characteristics of local funding, which is one of the features that defines Gipuzkoan industry.

Table 4 looks at industrial capital in Gipuzkoa with greater precision, taking into account the sector in which it was invested. In the first block, the relative weight of capital from industry is established in relation to other professional activities.

**Table 4.** Characteristics of Gipuzkoan investment from industrial activity, 1886–1926 (in percentage)

SECTORS	PROFESSIONAL ORIGIN OF THE CAPITAL			INDUSTRIAL ORIGIN		
	RECORDED CAPITAL Ptas.	OTHER ORIGIN (%)	INDUSTRIAL ORIGIN (%)	WITH INTERESTS IN OTHER SECTORS (%)	SINGLE INVESTMENT (%)	
<b>CONSUMER GOODS</b>	Food and drink	16,893,413	73.18	26.82	31.65	68.35
	Textiles	22,207,827	64.55	35.45	40.23	59.77
	Canvas sandals and footwear	2,169,907	68.52	31.48	38.13	61.87
	Paper	17,418,980	66.27	33.73	44.77	55.23
	Graphic arts	22,062,342	36.32	63.68	46.08	51.35
	Others	3,702,209	40.52	59.48	48.65	50.17
<b>PRODUCTION GOODS</b>	Wood	3,560,304	40.15	59.85	33.85	66.15
	Metallurgy	33,425,136	29.59	70.41	43.96	56.04
	Iron and steel	4,569,968	34.59	65.41	26.38	73.62
	Naval construction	5,048,500	32.56	67.44	31.88	68.12
	Construction materials	9,398,695	67.31	32.69	32.96	67.04
<b>ARMS</b>	10,855,703	16.24	83.76	49.83	50.17	
<b>MINING</b>	14,508,314	69.34	30.66	1.7	98.3	
<b>ELECTRICITY</b>	11,809,073	63.34	36.66	30.23	69.77	
<b>CHEMICAL</b>	11,874,096	38.34	61.66	9.93	90.07	
<b>SERVICES</b>	Financial	7,086,271	45.64	54.36	10.4	89.6
	Transport	897,400	49.69	50.31	14.31	85.69
	Leisure	18,507,566	62.77	37.23	17.75	82.25
<b>TOTALS</b>	<b>215,995,705</b>	<b>46.92</b>	<b>53.08</b>	<b>34.91</b>	<b>65.09</b>	

Source: Compiled by authors using the GMR, Books 1–40.

In the second column, the percentage of industrial investors that participated in more than one company is calculated in relation to those that appeared in only one establishment.

As we can see, industrial capital had greater relative weight in production goods than in consumer goods, with the exception of the graphic arts and the 'others' category in which umbrellas, wicker furniture, and tanning are included. It is worth highlighting the considerable predominance of industrialists in iron and steelwork activities, naval construction, and in the arms industry, a completely logical fact if we consider the degree of specialization and greater production scale required by these activities. We must not assume that the industrial origin of this capital comes from the reinvestment of profits. This was decisive in pioneering sectors such as the textile sector (30% of the total) or the paper sector, which diversified into related sectors such as paper manufacturing or graphic arts. But without doubt, throughout the period studied, new business opportunities emerged that were attractive not only to already established industrialists but also to small savers, liberal professionals in a comfortable economic situation, and qualified workers that decided to merge together to embark on business ventures.

### **Analysis of corporate relationships in Gipuzkoa**

In an effort to systematize the analysis of the investment interests and the transfer of capital between the different sectors, we used social network analysis (SNA<sup>5</sup>) applied to corporate relationships. For this, we considered that there is a corporate relationship, and hence a convergence of interests, when a partner participates in more than one company. Therefore, for this analysis we have only taken into account investors that fulfilled this condition.

From a temporal point of view, the establishment of companies was much more intense after the beginning of the Great War than in the previous years. Therefore, we have divided the analysis of the corporate network into two chronological blocks according to the date of

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<sup>5</sup> For the SNA we used Ucinet software for Windows (Borgatti, Everett, and Freeman 2002).

registration of the companies.<sup>6</sup> The first encompasses the period between 1886 and 1913, in which 425 companies were considered, involving 1875 partners, and the second covers from 1914 to 1926, with 585 companies and 2224 partners. There were people that carried out investments in both phases and, therefore, when it comes to identifying corporate relationships, we have excluded investments made after 1913 in the first phase, while for the second phase we considered investments for both periods. Thus, for example, if we consider an investor that shared a company with another in 1912 and with a third in 1914, we would have a single relationship for the first period and two for the second, since we consider that the personal relationship with the first of the partners is maintained, even if the period of study has changed.

The statistical markers resulting from the SNA for both periods confirm the consolidation of the corporate network in the period following the outbreak of the First World War, both in terms of its density and the degree of betweenness among the participating members (Table 5).

The graphic representation of the SNA provides us with quite a clear idea of the possible convergence of interests among the businesses that shared partners. The companies are represented by nodes of different colours according to the sector to which they belong and of different sizes according to the degree of centrality that each of them has (i.e. how many nodes they are directly connected with). In order to make the graph clearer, we eliminated the nodes that remained isolated (none of their partners participated in another company) and we applied principal component analysis.<sup>7</sup>

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<sup>6</sup> When there were changes in the company's information due to alterations in the business name or capital increases, we applied the last business name used in the period analysed.

<sup>7</sup> On social network analysis methodology see Borgatti et al. 2002 and 2009.

**Table 5.** Measures of centrality in the Gipuzkoan corporate network, 1886–1926

	1886–1913	1914–1926	1886–1926
Density (%)	1.222	1.535	2.370
Degree of connection (%)	0.091	0.132	0.266
Centralization index (%)	0.360	3.27	3.73
Betweenness	0.007	0.060	0.078
Closeness	0.111	0.123	0.140
<b>Number Companies</b>	<b>425</b>	<b>585</b>	<b>984</b>
<b>Number Partners</b>	<b>1,875</b>	<b>2,224</b>	<b>3,835</b>

*Source:* Compiled by authors using the GMR, Books 1–40. SNA: Ucinet for Windows (Borgatti, Everett, and Freeman 2002).

The first network (Figure 1) shows a typical small-worlds structure with an extremely high degree of compartmentalization and low relational density. However, in it we can distinguish two groups in which the corporate relationships between the companies are more intense:

1. The group formed around the *Compañía de Asfaltos de Maeztu*, the *Banco Guipuzcoano*, the *Maquinista Guipuzcoana*, and several electricity companies, such as the *Compañía eléctrica de San Sebastián* or *Electra del Urumea*. There are also several power companies, paper mills, and companies from the services sector in this network.
2. The metallurgical group, which forms around the *Unión Cerrajera* and links, through this, with the Eibar arms district formed around *La Eibarresa*.

After the First World War (Figure 2), the network continues to present a small-worlds structure, but much more internally cohesive and connected by key companies that take on a high degree of centrality.

1. The first subgroup is formed by the arms industry united around *La Eibarresa* and the *Cooperativa Eléctrica Eibarresa*. From this, another subgroup emerges dedicated to construction materials and whose central company is *Cementos Zumaya*, linked to the previous group through canvas sandal factories and knitted goods factories in Azpeitia and

Azcoitia. We must point out that the arms and canvas sandal manufacturing activities form industrial districts that emerge as geographic areas capable of generating nodes.

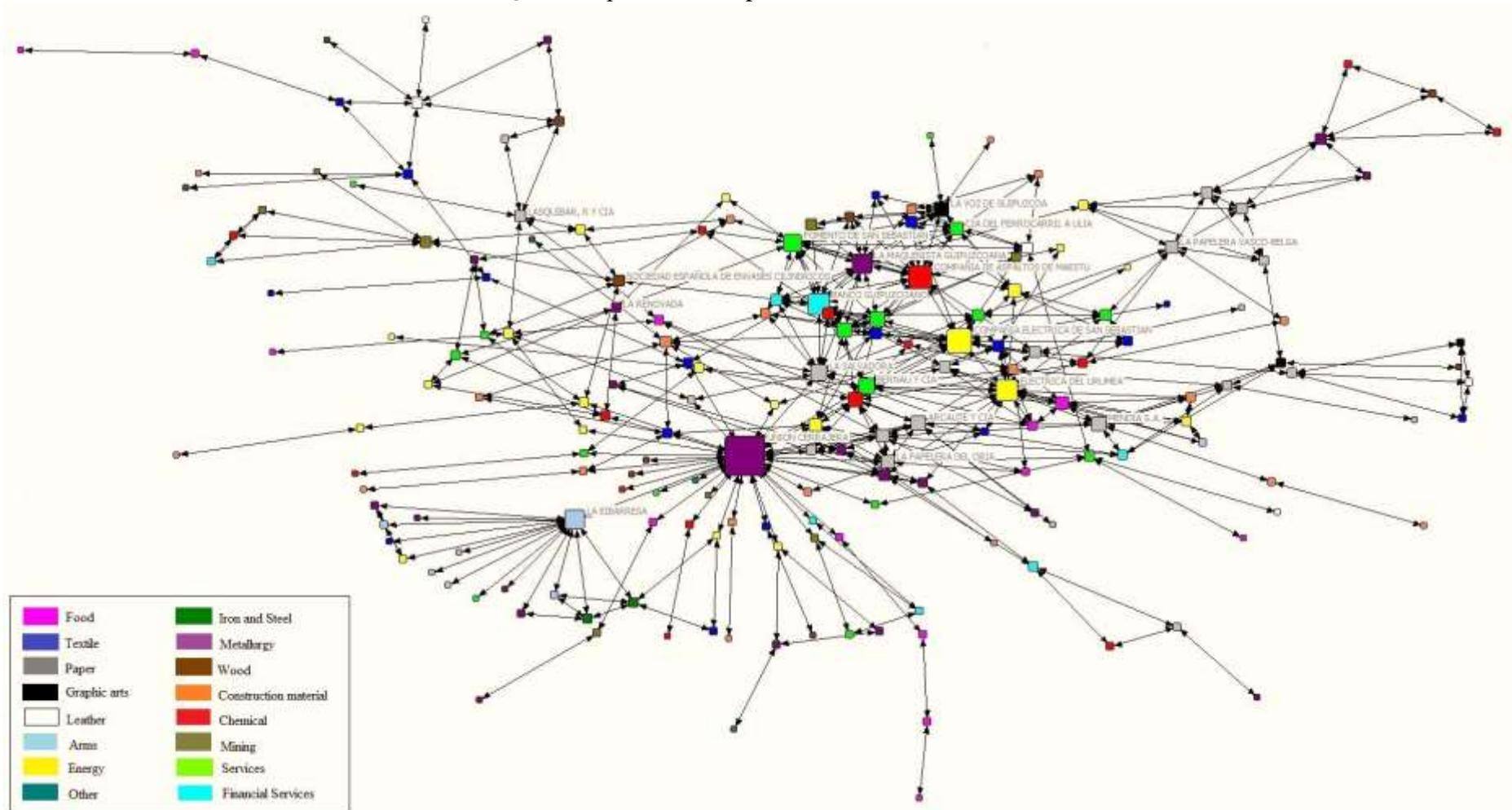
2. Linked to the previous network by *Carpintería Mecánica La Fe* and the *Sociedad Explotadora Canteras de Ulía*, both with headquarters in San Sebastián, we find the network formed around the *Banco de Crédito Hipotecario* and the *Café Guria*. Hotel and leisure businesses develop around this network, together with various companies dedicated to paper manufacturing (*Manufactura de Papel Record*, *Sociedad Española de Papelería*, and *Fábrica Española de Papeles Químicos*) and the graphic arts (*Sociedad Editorial Omnium*, *Aldus*, and *Editorial Saturnino Calleja*). The chemical company *Compañía Industrial Española*, dedicated to the production of arsenic and sulphuric acid, serves as a nexus with another sub-network. At the centre of this sub-network we find the chemical company *Franco Española de Petróleos*, the automotive company *Urcola, Vignau y Compañía*, and the *Papelera del Araxes*. This last sub-network would form a completely innovative and highly technological group with companies dedicated to the manufacture of cars (*Urcola, Vignau y Compañía*), aeronautics (*Compañía Española de Navegación Área*), lifts (*Ascensores Muguerza*), pyrotechnic material (*El Caos*), and several shipyards.

3. The chemical companies *Moelline Lubricating Company* (oiling and lubricants) and *Puig y Compañía*. (dry wood distillation) connect the previous network with another more dense one formed by several electricity companies (*Hidráulica Sumbilla, Compañía Eléctrica de San Sebastián*, and *Electra del Urumea*) and linked, in turn, with the paper sector and the *Banco de Tolosa*. *Electra Tolosana* and the *San Jose-Belauntzako-ola* paper mill connect this network with another subgroup formed by *Unión Eléctrica Vasco-Navarra* and the *Sociedad Industrial Minera Guezala*.

In short, the Gipuzkoan business fabric gradually evolved from a very compartmentalized corporate structure (with multiple small investors interested in activities with a prior tradition in the region) towards another more organized network formed by several business cells that incorporated electricity or financial companies with a high degree of betweenness. This gives us an idea of how the local business sector participated through the provision of electricity and funding instruments to the industrial districts.

As we can deduce from the betweenness data for the period 1886–1926 (Table 1 in the Appendix), the paper companies, followed by those dedicated to energy production, had a leading role in the transfer of capital, as well as significant influence in the network. The paper companies were pioneers in the establishment of public limited companies and, therefore, in the attraction of capital from very diverse fields, while also fostering a strong publishing sector (*La Voz de Guipúzcoa*). Moreover, by backing a model that involved having their own power station, their links to the energy sector became even stronger. Despite this, the energy companies with the highest degree of centrality were those linked to the arms industry (such as the *Cooperativa Eléctrica Eibarresa*, which brought together a large number of partners from the district) or to the urban development of the province (*Compañía Eléctrica de San Sebastián*, *Electra de Arditurri*, *Compañía Eléctrica de Portugal*, or *Hidráulica Sumbilla*).

Figure 1. Gipuzkoa's Corporate Network 1886–1913



Source: Compiled by authors using the GMR, Books 1–40. SNA: Ucinet for Windows (Borgatti, Everett, and Freeman 2002).

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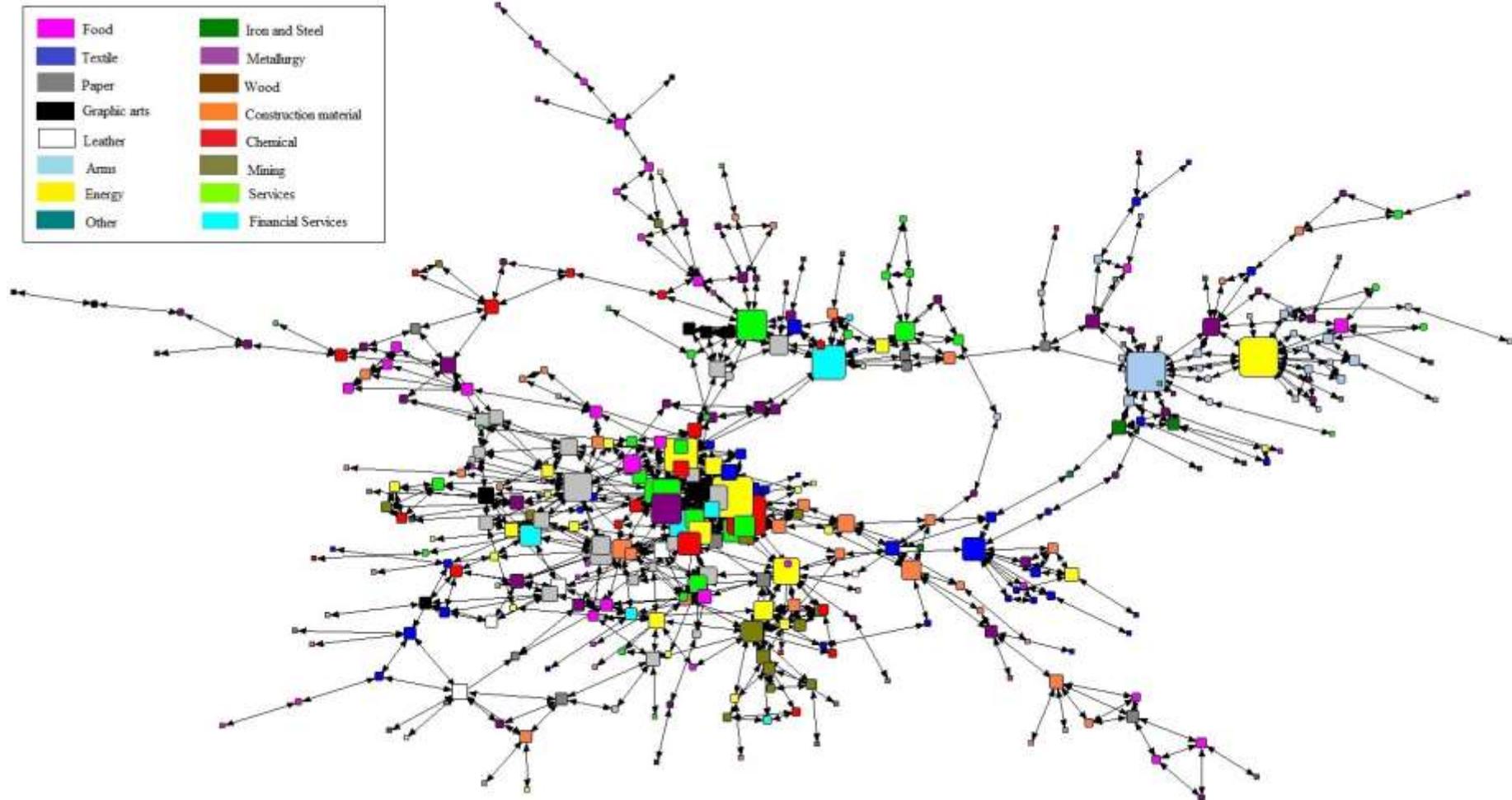
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Figure 3. Gipuzkoa's Corporate Network 1886–1926



Source: Compiled by authors using the GMR, Books 1–40. SNA: Ucinet for Windows (Borgatti, Everett, and Freeman 2002).

The construction materials subsector experienced a sharp rise in the province driven by increasing demand for housing and factory buildings. Wood and ceramic materials, cements, or the quarrying of minerals used in construction were all adapted to the needs of a growing economy. The modernization process was carried out from within the sector, with costs and risks being taken on in a collective manner. Cement plants and oil products attracted many partners since they required sizeable investments, such as that made by the *Hijos de José María Rezola* when they turned a hydraulic lime factory into a Portland cement factory.

The traditional sectors, such as food or textiles, attracted less capital, with the exception of the canvas sandal-making district represented by *Epelde, Larrañaga y Compañía*, or the production of flours (*Londaiiz, Ubarrenechea y Compañía*). The metal industry, for its part, had very special quantitative and qualitative importance since it represented the region's manufacturing tradition. *La Maquinista Guipuzcoana* or *Unión Cerrajera* attracted a great number of investors from the hardware and arms sectors.

The development of elite tourism favoured investment in entertainment services such as *Lalanne y Compañía* (bullfighting), *Fomento de San Sebastián* (bullfighting and hotels), *Bernau y Compañía* (hotels), and companies promoting coffees, restaurants, or spas. Last, but not least, the financial sector would be very present in all of the corporate networks, with the exception of the arms network which was fed by industrial capital. The *Banco de Tolosa* was located in and provided service to the paper district, the *Banco de Crédito Hipotecario* was linked to the services sector, while the *Banco Guipuzcoano* diversified its relationship with different sectors and companies with a high degree of betweenness, such as *La Maquinista Guipuzcoana*, *Compañía de Asfaltos de Maeztu*, or *La Voz de Guipúzcoa*.

Added to the confirmation of the pre-eminence of local capital in the Gipuzkoan industrializing process, the graphic representations obtained allow us conclude that social capital played a decisive role during the period studied. Thus, on the one hand, we have been able to confirm the importance that San Sebastián (province capital and summer vacation spot for King Alfonso XIII and his court) gained in the creation of diverse and innovative businesses. The concentration of a large number of influential people with investment capacity in this city made it a breeding ground for new business initiatives. In this context, social relations must have played a key role.

On the other hand, the industrial districts (paper, arms, canvas sandals, etc.) also occupied a significant place in the provincial network as the source of multiple intra- and inter-sectoral relationships. The higher degree of social capital present in these industrial agglomerations boosted collaboration between entrepreneurs and drove, therefore, the creation of companies that offered financial services, energy, or other types of inputs to the predominant sector in each agglomeration.

### **The arms industry**

The Basque arms industry was geographically concentrated in Eibar and surrounding towns, forming a classic Marshallian industrial district (Goñi 2010). In 1914, there were 46 factories and workshops dedicated to the manufacture of pistols and revolvers and 12 specialized in the manufacture of shotguns, which covered practically all industrial activity in the area.<sup>8</sup> In many of these companies, above all in the case of small arms, only the final phases of the production process were carried out, with parts manufacturing and other operations being subcontracted to other companies. For this reason, together with the larger establishments,

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<sup>8</sup> There were also three foundries with a total of 114 workers as well as other similar establishments that employed some 48 operators (Goñi 2010, 110).

there was a significant number of small workshops or individual arms manufacturers. The majority of the entrepreneurs were old operators that had managed to prosper, generally in association with other arms manufacturers. This favoured relations between employers and workers within the district, thus tempering labour conflicts (Goñi 2010, 115–117).

This structure granted the arms industry a productive flexibility that allowed it adapt to variations in demand and to specialize in the manufacture of medium-to-low quality products. The growth in production at the end of the 19<sup>th</sup> century and the beginning of the 20<sup>th</sup> century was mainly linked to the strength of exports, which represented at least 80 % of small arm manufacturing in Eibar. In the case of shotguns, on the other hand, the internal market represented a much greater proportion of sales and it was still an activity with a marked artisanal character, dominated by small workshops and individual gunsmiths.<sup>9</sup>

The information obtained from the MR indicates that the arms company model was that of the general partnership (very rarely the limited partnership), where all of the partners contributed the same amount of capital and took on risks on equal terms. Often the capital contributions were not monetary, but rather corresponded to machinery or patents from previous failed business initiatives.

One of the characteristics of industrial districts is the creation of collective institutions such as training, research, or quality control centres, and also including joint ventures for complementary activities or the procurement of inputs (Piore and Sabel 1990, 51; Valdaliso and López 2007, 286). Thus, in Eibar, the *Escuela de Armería* (armoury school) (1913) and the *Banco Oficial de Pruebas* (proof house) (1923) were set up on the initiative of the local institutions and with the support of a large part of the business and working class sectors.

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<sup>9</sup> The average size of the establishments dedicated to the manufacture of hunting rifles was 12.5 operators, while those making small arms employed an average of 42.5 workers.

Some of the business initiatives that emerged during the period of study also responded to that collective spirit and, although they were registered as public limited companies, the relatively high number of partners they had and the modest and equal individual capital contributions made mean we could consider them as cooperatives. In other cases, this is not so evident since the number of registered founders is limited, even if the company name leaves no room for doubt, such as in the case of the *Cooperativa de Producción de Armas de Fuego Alfa, S.A.*<sup>10</sup>. The arms scene was, therefore, a pioneer in Gipuzkoan productive cooperativism, even if under this category only two companies were actually registered as such: *Danok Bat* (1919) and *Industrial Obrero Armera* (1920)<sup>11</sup>.

When it came to applying the SNA methodology to Eibar, two types of networks were used. Firstly, as for the overall province, we developed what we have called corporate networks, created on the basis of the relationships established between the companies set up in the period studied through their shared partners. Secondly, another type of network was developed in which the nodes correspond to the investment partners from Eibar. In this case, the nexuses are generated when they have a shared presence in one of the companies.

Figure 4 shows us a panoramic view of the companies in Eibar and the existing relations between them. The arms industry is predominant among the companies created and presents a very heterogeneous network structure and a low degree of density (17.33%). Moreover, there are various unrelated subgroups that almost exclusively maintain family ties or that diversify their production by extending the business towards other types of activities. This

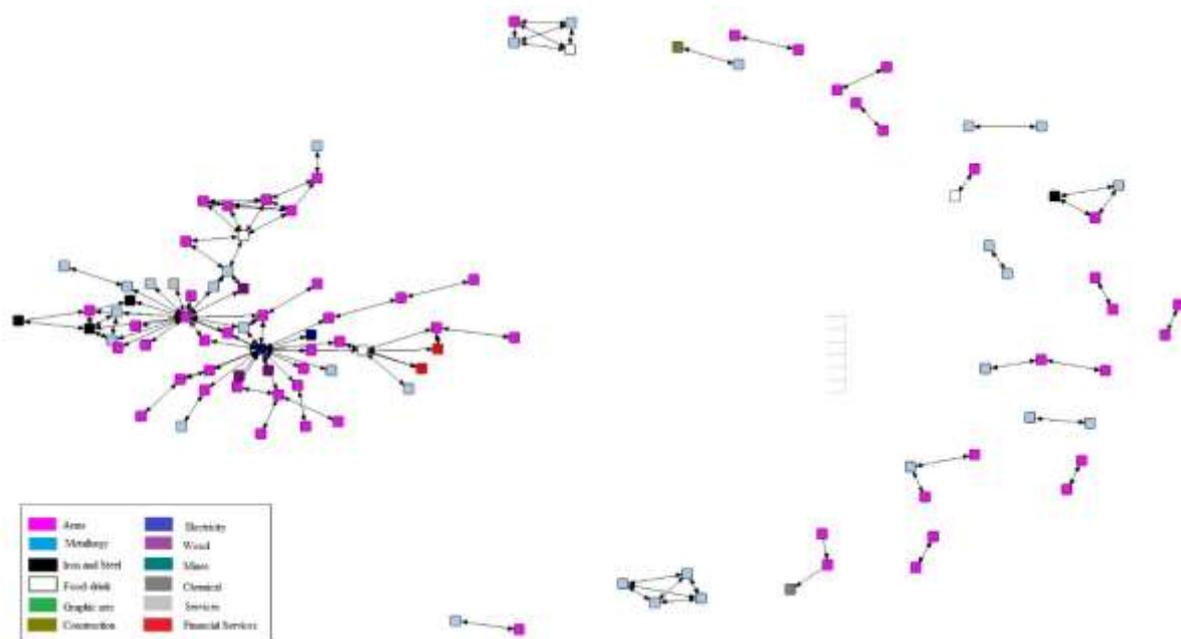
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<sup>10</sup> This was a project promoted by socialist arms manufacturers in Eibar after the strike of 1919, with the aim of manufacturing revolvers under favourable salary conditions for the workers. From 1929, it began to substitute its arms production for the production of sewing machines, which ended up becoming its primary activity (Iza-Goñola 2005, 17–44).

<sup>11</sup> This company was dedicated to the manufacture of Eibar-type pistols, with no sign of activity beyond 1929 (Calvo 1997, 231).

diversification intensified after the First World War due to the serious crisis that arms manufacturing experienced, with bicycles and sewing machines standing out among the new products (Goñi 2008, 214–215).

**Figure 4.** Network structure of companies in Eibar 1885–1925



*Source:* Compiled by authors using the GMR, Books 1–40. SNA: Ucinet for Windows (Borgatti, Everett, and Freeman 2002).

However, the most characteristic element of the corporate network in Eibar is the unifying role played by three companies: *Aurrera*, *La Eibarresa*, and *Cooperativa Eléctrica Eibarresa*. The first was set up in 1891 as a public limited company on the initiative of gunsmiths from Ermua (Bizkaia) and a handful from Eibar (35 in total), with each contributing 2775 pesetas. Two years later, in 1893, almost half of the *Aurrera* partners, together with other industrialists, promoted the creation of another public limited company (*La Eibarresa*), with the intention of manufacturing shotgun barrels for the entire district. This initiative received a very positive response among arms manufacturers since it managed to unite 113 partners with

an equal investment per capita of 1096 pesetas. Among them there were small and large producers, as well as figures with significant social and political weight such as Juan José Larrañaga, mayor of the town, or Antonio Iturrioz and Nemesio Astaburuaga, who would occupy that same post some years later. The importance of *La Eibarresa* in the cohesion of Eibar's corporate network is decisive, with its partners participating in another 38 companies. However, its trajectory as a business project was not very successful. From the beginning it experienced many difficulties and although two years after its creation it was still active, we have found no reference to it beyond that period (Bustinduy 1894, 125).

Figure 5 focuses only on the partners of the three large companies analysed and shows their degree of betweenness, which is especially high for the *Cooperativa Eléctrica Eibarresa*. This company, founded in 1918, had 43 partners (32 arms manufacturers) that the press at the time described as 'prestigious neighbours' of the district and that contributed an equal capital of 2000 pesetas each to the company.<sup>12</sup> In the graph there are no direct nexuses detected between the partners of *Aurrera* and those of the *Cooperativa Eléctrica Eibarresa*, and they are also scarce between the latter and the gun barrels cooperative: only Víctor Sarasqueta, Julián Aramberri, and Eusebio Arrillaga invested in the last two. This situation is most likely attributable to the time lapse between the founding of these companies. *Aurrera* and *La Eibarresa* were created in 1891 and 1893, respectively, while the electricity cooperative was set up in 1918.

In 1891 Víctor Sarasqueta had just begun manufacturing full shotguns in a small workshop that he owned, while in 1918 he was the most renowned arms manufacturer in the area as well as the owner of the largest shotgun factory (Calvo 1997, 302–305; Larrañaga 2001, 219; Goñi

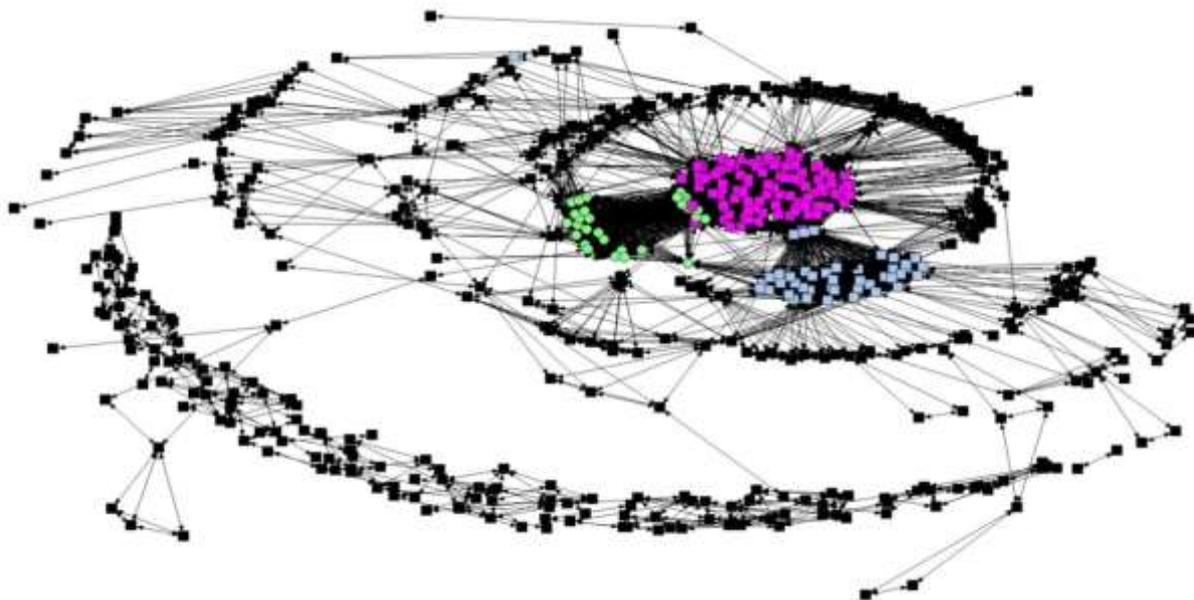
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<sup>12</sup> *La Voz de Guipúzcoa*, 28/05/1918, p. 5.



the greatest density and centrality are those formed around *Aurrera* (green nodes), *La Eibarresa* (pink nodes), and the *Cooperativa Eléctrica Eibarresa* (blue nodes). Linked to these, with weaker nexuses, there is a second group with indirect links to the central nucleus. Lastly, in the periphery of the network we find the investors with the smallest number of nexuses and endogamous corporate relationships.

**Figure 6.** Network of partners of companies established in Eibar (1885–1925)



*Source:* Compiled by authors using the GMR, Books 1–40. SNA: Unicet for Windows (Borgatti, Everett, and Freeman 2002).

The analysis of the nodes' degree of centrality and betweenness allows us see which partners managed a greater quantity of information and which ones served with greater intensity as intermediaries between another two partners from the same group that had no relationship of their own (see Tables 2 and 3 in the Appendix).

We have already emphasized the role played by Víctor Sarasqueta in the network when we analysed the three central companies (Figure 5). The participation of this arms manufacturer

in two of the companies that brought together the most partners grants him a high degree of betweenness (1<sup>st</sup>) and centrality (2<sup>nd</sup>), which is consistent with his position as the most important and prestigious shotgun manufacturer of the period.

Among the most important actors in the network, and with a privileged position in it, we also find Jacinto Orbea Alberdi (1<sup>st</sup> centrality, 5<sup>th</sup> betweenness) and his cousin Juan Orbea Areitio (6<sup>th</sup> centrality). The *Orbea y Compañía* factory, a firm created in the mid-19<sup>th</sup> century, occupied a dominant position in Eibar's industrial district. In 1914 it was the largest company in the town, with 404 workers. The members of the Orbea family were the main representatives of the conservative party in the City Council of Eibar and their presence in and influence on political and social life in the town, and even in the overall province, was very significant (Echevarría 1990, 29). Jacinto Orbea Alberdi was the leader of the conservative party in Eibar at the beginning of the 20<sup>th</sup> century and his brother, Miguel María, held the post of mayor between 1904 and 1908. A third brother from the same family, Wenceslao Orbea Alberdi, held important offices in the provincial council and was elected on two occasions as a Member of Parliament for the Bergara district, which Eibar was part of. He was also the founder and president of the Board of Directors of the savings bank *Caja de Ahorros Provincial de Guipúzcoa* (1911–1916 and 1918–1919), as well as of the *Banco Guipuzcoano* (Martínez Artola 2016).

Another name that appears among the top positions is José Felipe Artamendi. This investor participated both in *Aurrera* and in *La Eibarresa*, as well as setting up (together with his children) a well-known razor blade factory during the first half of the 1920s. We also find Eulogio Anitua Garmendia, who belonged to one of the families that owned the company

*Gárate, Anitua y Compañía (G.A.C.)*, the second most important company in Eibar.<sup>14</sup> This company was linked to *La Eibarresa* through Eulogio and to *Aurrera* through his brother José Francisco. Another important person in the network was Martín Antonio Bascaran, partner of both *Aurrera* and of *La Eibarresa*, and also one of the main manufacturers of automatic pistols at the beginning of the 20<sup>th</sup> century.<sup>15</sup>

Greater qualitative knowledge of the industrial district of Eibar allows us verify the potentialities of SNA as an instrument for analysing the business reality of the period. The collective nature of three of the network's key business initiatives (*Aurrera*, *La Eibarresa*, and the *Cooperativa Eléctrica Eibarresa*) could lead us to consider them as products of the high degree of social capital present in industrial districts (Putnam 1993, 142). The dense and dynamic social fabric, the special links with the territory, the existence of shared values, and the intensity of the intercompany relationships (due to the subcontracting of production operations) explain, to a large extent, the existence of these types of initiatives. These companies, in turn, could mean a future source of social capital for the arms industry by strengthening existing relationships between different investors in the area, favouring the exchange of information and, probably, the subsequent implementation of new initiatives. From this perspective, participation in these institutions could also be interpreted as a means to increase social relations and, therefore, as an investment in social capital.

Although we do not have detailed information on the identity of each and every one of the partners in these companies, we do in fact have some examples that cast doubt on the applicability of this last interpretation to the case at hand. There are several people that coincided as investors in those companies, but that elsewhere strongly clashed. Thus, for

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<sup>14</sup> The factory, which was dedicated to the manufacture of pistols and revolvers, employed 200 workers in 1914 (Calvó 1997, 210–212; Goñi 2010, 110).

<sup>15</sup> His factory had 30 operators in 1914 (Goñi 2010, 110).

example, Antonio Iturrioz and Jacinto Orbea participated in *La Eibarresa* as leaders of the republican party and the conservative party, respectively, and were the protagonists of heated personal confrontations.

A similar case is that of Tomás Echaluze, correspondent for the republican newspaper *La Voz de Guipúzcoa*, and the socialist leader Aquilino Amuategui. Both participated in the subscription of shares of a project for a shotgun factory backed by the *Escuela de Armería* in 1918 to tackle the foreseeable post-war crisis.<sup>16</sup> This company did not materialize in the end, nor was it ever placed on public record, but it is similar to the aforementioned collective projects in Eibar. The correspondent from Eibar was quite a politically active person and had frequent collisions with the socialists in general, and with Amuategui in particular, even resulting in personal attacks.<sup>17</sup> Another person that also appears among the shareholders of this initiative is Esteban Barrutia, who was the first socialist to get a councillorship in Eibar in 1905, but who later suffered the heated hostility of his old fellow party members when some years later he joined the republican party.<sup>18</sup>

In our opinion, these examples show that participation in these collective initiatives did not respond exclusively to business investment interests, but was imbued with a feeling of belonging to the community, and probably also of a certain degree of public commitment (sincere or not) to the initiatives that were considered beneficial for the economic future of the town. This would explain the co-existence in shared projects of people who displayed manifest personal enmity. Putnam (1993, 152–163) grants this commitment to the community, or civic virtue, a key role in his explanation of unequal economic development in

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<sup>16</sup> Tomás Echaluze was in the workers group with 500 pesetas and Aquilino Amuategui was in the manufacturers group with 2000 pesetas: Municipal Archive of Eibar, Sign. B 53.

<sup>17</sup> *La Voz de Guipúzcoa*, 08/11/1914, p.3 and 06/05/1915, p.4.

<sup>18</sup> *La Voz de Guipúzcoa*, 13/08/1915, pp. 2–3

Italian regions. The propensity towards cooperation will be, likewise, more intense in those communities where historically we find an accumulation of a high stock of social capital (Putnam 1993, 167), which fits perfectly with the case of Eibar.

The case of Eibar also allows us check for other weaknesses in the methodology used as an indicator of the degree of social capital in the province. We considered that kinship could play an important role in the network's cohesion, both at the local and the provincial level, but the overlap of surnames makes its assessment difficult. Likewise, we know of some corporate relationships that would link Eibar's arms district with other industrial sectors, but which the source does not identify as such. This is the case of Víctor Bernedo, who in the sample of companies used appears as an Eibar-based partner in the firm *Bernedo, Echeverría y Elorza* (Legazpia), founded in 1920 with the purpose of manufacturing nuts and bolts. However, we also know that Víctor Bernedo was a renowned manufacturer of automatic pistols in Eibar (Calvo 1997, 140–141).

The existence of these cooperative companies or projects favourably skews the degree of betweenness and centrality of the partners that participated in them, despite the fact that some of them, such as *La Eibarresa*, would be short-lived or would never materialize. On the other hand, the criteria used for the selection of companies caused other business projects with similar characteristics to be excluded from the sample. This was the case of the aforementioned shotgun factory, which was never established, or the public limited company *Industrias Bakelan*, which was excluded from the database because it did not fulfil the general conditions established in the methodology. This company was promoted in 1919 by several of

Eibar's most prestigious businesspeople in order to carry out the transformation of the arms industry into a type of metal production not related to armoury.<sup>19</sup>

## Conclusions

Generally, SNA in the business field has been used as a means to demonstrate the existence of business groups through the identification of common members on the boards of directors of public limited companies in a specific geographic area. In the Gipuzkoan case, and in the period studied, this type of analysis would involve a reductionist skew due to the elevated presence of general and limited partnerships in the province's business fabric. In any case, with the general rule being that the number of partners involved in these types of partnerships is reduced and bearing in mind only the founding partners of the public limited companies, we consider the methodology used to be appropriate for the overall province. Thus, it seems clear that the strengthening of personal relationships between partners, through the shared creation of companies, was a source of new business initiatives and formed a reserve of valuable social capital for the overall territory.

Likewise, the graphs obtained have allowed us visualize the intense links that Gipuzkoan industrial activities had with the territory. San Sebastián, as capital of the province and summer location of the Spanish oligarchy of the period, concentrated greater business diversity, while in the rest of the counties we observe significant territorial specialization. We thus find the paper district of Tolosaldea, the canvas sandal district of Azcoitia, or the metallurgy district in the Deba Valley. Among these districts, we also find the arms district of Eibar, which has allowed us carry out a more exhaustive analysis of one of the groupings of nodes identified in the overall provincial network.

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<sup>19</sup> *La Voz de Guipúzcoa*, 01/02/1919, 7.

The detailed study of the Eibar case reveals the complexity of the social relations that supported the industrialization process. At the same time, the investment dynamism shown by the arms manufacturers of Eibar, and its channelling towards collective projects, suggests that the social capital accumulated in this town was decisive for the success of the arms industry during those years. This investment dynamism was also reflected at the provincial level; among the capital that came from industry, the arms sector was the one that showed the greatest interest in investing in other industrial activities. However, through this case we have also been able to detect some weaknesses that, extrapolating them to the overall territory, add nuances to the degree of representativeness of the methodology used. This obliges us to consider the results obtained as an approximation to a much more diverse and complex reality than that revealed by the networks shown here.

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## Appendix

**Table A1.** Gipuzkoan companies with the highest degree of betweenness established via their partners 1886–1926

COMPANY	DEGREE	SECTOR	LOCATION	CAPITAL PTAS.
LA EIBARRESA	39.000	ARMS	EIBAR	125,000
COMPAÑIA DE ASFALTOS DE MAESTU	30.000	CHEMICAL	SS	300,000
ELECTRICA DEL URUMEA	29.000	ENERGY	SS	650,000
COMPAÑIA ELECTRICA DE SAN SEBASTIAN	27.000	ENERGY	SS	500,000
BANCO GUIPUZCOANO	27.000	FINANCIAL	SS	
LA MAQUINISTA GUIPUZCOANA	26.000	METALLURGY	SS	1,307,000
COOPERATIVA ELECTRICA EIBARRESA	25.000	ENERGY	EIBAR	105,000
LA VOZ DE GUIPUZCOA	22.000	GRAPHIC ARTS	SS	16,746
BANCO DE CREDITO HIPOTECARIO	20.000	FINANCIAL	SS	20,000,000
EPELDE, LARRAÑAGA Y CIA	20.000	TEXTILE-CANVAS SANDAL	AZCOITIA	408,000
CAFE GURIA	19.000	SERVICES-HOTEL SECTOR	SS	16,100
MENDIA S.A.	18.000	CONTINUOUS PAPER	HERNANI	1,300,000
FOMENTO DE SAN SEBASTIAN	17.000	SERVICES-ENTERTAINMENT	SS	3,000,000
AURRERA	16.000	IRON AND STEEL	EIBAR	97,151
LONDAIZ, UBARRECHENA Y CIA	16.000	FOOD-FLOURS	SS	2,200,000
ARANA, UNIBASO Y CIA	16.000	SERVICES-HOTEL SECTOR	SS	600,000
ELECTRA DE ARDITURRI	16.000	ENERGY	PASAJES	125,000
BERNAU Y CIA	16.000	SERVICES-ENTERTAINMENT	SS	225,000
UNION CERRAJERA	15.000	METALLURGY	MONDRAGON	7,707,500
MACHIMBARRENA Y CIA	14.000	SERVICES-ENTERTAINMENT	SS	450,000
ARCAUTE Y CIA	14.000	PAPER	TOLOSA	400,000
HIDRAULICA DE SUMBILLA	14.000	ENERGY	SS	1,150,000

COMPANY	DEGREE	SECTOR	LOCATION	CAPITAL PTAS.
LA SALVADORA	14.000	CONTINUOUS PAPER	VILLABONA	250,000
BANCO DE TOLOSA	13.000	FINANCIAL	TOLOSA	1,500,000
BRUNET Y CIA	13.000	COTTON FABRICS	SS	4,000,000
UBARRECHENA HERMANOS Y CIA	13.000	CEMENT	SS	85,000
RUPERTO REZOLA	12.000	HAND-MADE PAPER	TOLOSA	90,000
CIA ELECTRICA DE PORTUGAL	12.000	ENERGY	SS	200,000
CIA DEL FERROCARRIL A ULIA	12.000	SERVICES-TRANSPORT	SS	530,000
RUIZ DE ARCAUTE Y CIA	12.000	CONTINUOUS PAPER	TOLOSA	1,600,000
SOCIEDAD ESPAÑOLA DE PIEDRA-VIDRIO Y CONSTRUCCIONES GARCHEY	12.000	CHEMICAL-GLASS	SS	5,000,000
ASTILLEROS DEL DEBA EN DEBA	12.000	METALLURGY-SHIPYARD	EIBAR	300,000
LA VINICOLA VASCO-RIOJANA	12.000	FOOD-DRINK	EIBAR	55,000
ECHEVERRIA Y CIA	11.000	CHEMICAL-SOAP	SS	10,000
IRAZUSTA, VIGNAU Y CIA	11.000	CONTINUOUS PAPER	TOLOSA	2,500,000
PAPELERA DEL ARAXES	11.000	CONTINUOUS PAPER	TOLOSA	250,000
CEMENTOS ZUMAYA	11.000	CEMENT	ZUMAYA	250,000
LA PRUDENCIA	10.000	COAL MINING	SS	175,000
LA PAPELERA VASCO-BELGA	10.000	PAPER	RENTERIA	600,000
HIJOS DE JOSE MARIA REZOLA Y CIA	10.000	CEMENT PLANT	SS	1,010,000
LALANNE Y CIA	10.000	SERVICES-ENTERTAINMENT	IRUN	95,000
BLAKE Y CIA	10.000	WOOD	SS	60,000
SOCIEDAD INDUSTRIAL MINERA GUEZALA	10.000	MINING	SS	10,000
ARIZMENDI HERMANOS	10.000	ARMS	EIBAR	98,999
NAZABAL Y CIA	10.000	PAPER MANUFACTURE	TOLOSA	327,000

*Source:* Compiled by authors using the GMR, Books 1–40. SNA: Ucinet for Windows (Borgatti, Everett, and Freeman 2002).

**Table A2.** Classification of partners in Eibar according to degree of centrality

<b>PARTNERS</b>	<b>NO. OF RELATIONS</b>	<b>DEGREE OF CENTRALITY (%)</b>
Jacinto Orbea Alberdi	174	7.487
Victor Sarasqueta Suinaga	170	7.315
Julian Aramberri Muguerza	166	7.143
Eusebio Arrillaga Arriola	160	6.885
José Felipe Artamendi Amesti	154	6.627
Juan Orbea Areitio	151	6.497
Tiburcio Albistegui	150	6.497
Eulogio Anitua Garmendia	149	6.411
Martín Antonio Bascaran Ibarra	143	6.153
Manuel Arguiano	143	6.153

*Source:* Compiled by authors using the GMR, Books 1–40. SNA: Ucinet for Windows (Borgatti, Everett, and Freeman 2002).

**Table A3.** Classification of partners in Eibar according to degree of betweenness

	<b>Betweenness</b>	<b>nBetweenness</b>
Victor Sarasqueta Suinaga	9336.474	5.541
Julián Aramberri Muguerza	6171.330	3.663
Eusebio Arrillaga Arriola	6083.192	3.610
Baltasar Urresti Juaristi	6010.261	3.567
Jacinto Orbea Alberdi	5763.857	3.421
Silverio Mandiola Aranceta	5324.544	3.160
Eduardo Orozco Urigoitia	5249.324	3.116
José M <sup>a</sup> Elorza Uria	4630.766	2.748
Tiburcio Albistegui Idarraga	4499.465	2.670
Martín Errasti Ibarzabal	4228.177	2.509
José M <sup>a</sup> Cruceta Izaguirre	4076.081	2.419
Eulogio Anitua Garmendia	3632.642	2.156

*Source:* Compiled by authors using the GMR, Books 1–40. SNA: Ucinet for Windows (Borgatti, Everett, and Freeman 2002).

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