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Networks of power and networks of capital: evidence from a peripheral area of the first globalisation. The energy sector in Naples: from gas to electricity (1862–1919)

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ABSTRACT

At the moment of Italian political unification, the Mezzogiorno (i.e. Southern Italy) was affected by a deep institutional change and it entered the wave of financial market openness, attracting all forms of investments from international capital markets. Naples – after having lost its previous role as the Bourbon kingdom’s capital city – enabled projects of large scale urban planning, beginning with basic public utilities. In this process, public and private lighting was chronologically the first area of interest – parallel with railway development planning – where international finance played a role. As evidence of the dynamics which brought this peripheral European area into the orbit of the first globalisation, this article addresses the complex business of energy supply in Naples – between 1862 and World War I – both from the point of view of its financial dynamics and the parallel evolution and organisational characteristics of the business actors involved. The Social Network Analysis (SNA) will support the reconstruction of the diversified and transnational businesses which the Neapolitan energy business was integrated in, at the same time giving evidence of both the bindings linking legally independent companies and the multiple relations between the actors involved. The transition from gas to electricity during this time marked the transition from weak to strong corporate ties according to the evolutionary trends both of technology and international financial markets.

KEY WORDS

Business groups; first globalization; Italian Mezzogiorno; Compagnie Napolitaine pour l’éclairage et le chauffage par le gaz; Società Meridionale di Elettricità; social network analysis

1. Introduction

Since the 1850s, and more intensely from the 1860s, in the European ‘capitals of capital’,¹ processes of both concentration and export of capital occurred. From European primary financial places, capital flowed toward peripheral countries – most in the form of foreign direct investment (FDI) – to facilitate industrialisation, technology transfers and infrastructure development, thus exploiting new investment opportunities besides those traditional in trade and sovereign bonds.² This way an increasingly integrated transnational financial-economic space gradually took shape. Along the patterns of these investment flows,

financial actors, entrepreneurs and high technicians crossed over borders shaping dense transnational inter-corporate and inter-actor networks, generally functioning as cooperatively organised business forms halfway between markets and hierarchies.³ These multinational enterprise-type investments carried ownership and control across borders, this way becoming one of the basic elements in the making of capitalism's first distinctive feature of globalisation.

As stressed by the literature,⁴ at the moment of its unification, Italy – a long time in the orbit of foreign capital – fully entered this wave of globalisation. Lacking both capital and technological resources, Italy became an FDI recipient. On one hand, the economic policies of the liberal modernising governments strongly increased strategic initiatives aimed at promoting infrastructure investments. On the other hand, both the capital cities of the pre-unification states and the main urban centres underwent dramatic transformations as a consequence of the major systemic changes which occurred. They were generally concerned by the expanding *networked city model*,⁵ in promoting urban planning and public utilities projects on a large-scale, so broadly attracting foreign investment.⁶

Naples – finally freed both from the restraints of the Bourbon kingdom and the Rothschilds' financial control⁷ – was the biggest Italian city in terms of inhabitants (447,075 people)⁸ and it still represented the main political, economic and financial centre of all Southern Italy. Furthermore, thanks to its geographical position, it was considered as a strategic hub within transnational projects of transport networks in the French vision for a 'Mediterranean system'.⁹ Its backwardness in infrastructure and local entrepreneurship brought international groups to make investments themselves, taking up the numerous profitable opportunities opened up by broad-ranging urban planning projects (i.e. railways, harbour, expansion both of eastern and western areas of the city, public utilities such as lighting, water supply and distribution, and urban transport).¹⁰ From 1862, public and private gas lighting was chronologically the first field of investment – parallel to railway development planning – where international finance played a role.

As evidence of the dynamics which brought this peripheral European area into the orbit of the first globalisation, this article addresses the complex business of energy supply in Naples – between 1862 and World War I – both from the point of view of its financial dynamics and the parallel evolution and organisational characteristics of the business actors involved. The whole Naples energy business gravitates towards the gas company, the *Compagnie Napolitaine pour l'éclairage et le chauffage par le gaz* (CNG) – founded in 1862 thanks to foreign capitalists – that was one of those few big European gas companies choosing to diversify in the electricity sector,¹¹ then founding, in 1899, the *Società Meridionale di Elettricità* (SME) the future leading company of one of the five Italian regional monopolies (Sip, Edison, Sade, La Centrale, and SME).

Thus the article focuses on the technological and financial crossroads between gas and electricity in Naples, which was in its turn a strategic crossroads between two of the most important and long-lasting Neapolitan companies (CNG and SME) for the control of the local energy market. The article will investigate this seamless integration between gas and electricity business by reconstructing and analysing the network of actors involved (promoters, founders, international and local shareholders, directors, bankers, technicians) underlying the changing business organisation forms that the Naples energy sector experienced during the period 1862 to 1919.

The critical importance of focusing on relationships between strategic actors, if considering the business organisation forms, is essentially suggested by the literature itself. Research results suggest that clusters of actors linked by different forms of relationships (including ownership relations, co-directorships, ethnic, religious, kinship ties, legal and technical competencies, financial expertise, etc.) always play a key role whether referring to system-building processes of technological systems,¹² or relating to the organisation forms of business groups,¹³ or, finally, with reference to business organisation forms linked to international capital flows such as multinational enterprises, in their development pattern from freestanding companies to corporate groups (shaped as holding companies).¹⁴

Furthermore, the many studies on interlocking directorates as well as those on corporate networks¹⁵ – as fundamental aspects of countries economic organisation and corporate governance systems – have increasingly strengthened the importance of investigating the systems of actors which economic action is embedded in. The way actors and firms relate and interact within corporate networks is crucial in revealing the interdependence between firms, economic elites, banking and financial system, structures of control and competition, through which scholars explain power structures within the different national varieties of capitalism.¹⁶ Italian scholars taking an active part both in national and international debate, have also highlighted the peculiar structural characteristics of the Italian corporate system.¹⁷ Furthermore, with the support of the Social Network Analysis (SNA), extensive interlocking directorates have revealed the pervasive presence and importance of business groups within the twentieth century Italian corporate system and – while assessing the collusive nature of the Italian capitalism – have confirmed the central role of the financial sector (banks and financial institutions) within the densely connected national networks in a long run perspective.¹⁸

Drawing on the results of the mentioned literature, the proposed micro case study of the Neapolitan energy sector aims at adding a new tessera to the already rich mosaic of the studies on the Italian corporate system. From the different perspective of the transnational organisation of a complex business and dating back the period of analysis to the early times of the Italian unification, the article aims to cast light upon the origins of those business organisation forms which progressively took root in the national economic environment starting from its very early stage of development. By combining historical method (research and analysis of archival sources) with the SNA methodology (see section 2) – in order to investigate the evolutionary dynamics of the international network which the two Neapolitan companies (CNG and SME) were embedded in – the article will try to explain how the network worked and if and how it mattered for actors to continue to raise finance for the local businesses during the time and to keep unchanged the competitive advantages deriving from their monopoly position in the Naples market. This way, even indirectly, the article aims to offer some new insights to those who study the impact of multinational enterprises on their host economies.

After the introduction, the second section describes the sources and the methodology which the article is based on. The third section deals with the structuring of the international business group which founded CNG. The following three sections examine the evolving strategies of cooperation/competition between actors and sources of energy, describing the transition from gas to electricity in Naples, as a transition from weak to strong corporate ties according to the evolutionary trends both of technologies and international structure of capital markets. The last section concludes.

2. Sources and methodology

The case study of the Naples energy power companies (CNG and SME) well epitomises how international and national business actors – mainly financial actors, given the capital intensive nature of the sector itself – interconnected extensively within a cross-border space necessarily variable over time, according to both the mobile flows of capital and technology.

This peculiar feature has demanded a spatialisation of archival sources, as well. They have been collected by gradually following the defining network of origin 'local' places of the actors involved in CNG's business, emerging from the research development itself. Starting from the origins of the primal FDI in the gas sector and tracing the subsequent rooting of international capital within the Neapolitan energy market as a space-time continuum towards the electric power business, the article draws on a broad range of archival sources complementary to those hitherto exploited by the literature on the Naples electric industry.¹⁹ New original documents made recently available by CNG's private archive along with the archival records collected at the Naples public archives: State Archive and Notary Archive, the Enel (Ente Nazionale per l'energia Elettrica) historical archive, the Central Archive of the Italian State (Rome), the French Public Archives: CARAN, CAEF (Paris) and CAMT (Roubaix), the Paris Municipal Archive, the Paribas historical archive and the BGE of Geneva, have been of crucial importance both for network data storing and interpretation.

The archival data have been stored using a large multi-source relational database, gathering interrelated datasets on economic and socio-political individual and collective actors operating in Southern Italy (and abroad) between 1808 and 1920.²⁰ The database IFESMez (Imprese, Finanza, Economia e Società nel Mezzogiorno [Enterprises, Finance, Economy and Society in the Mezzogiorno])²¹ has been tailored to meet the specific needs of a wider and long-term research project based on the above mentioned transnational approach for studying Southern Italy's economic system.²² IFESMez finally aims to reconstruct reliable historical information on Southern Italy's business structure over more than a century, in a period when official printed sources were lacking. It has been created during two years in order to collect data from Mercantile Courts (from 1883 onwards known as the Civil Court) archival funds available in Southern Italy, starting from Naples. This primary source allows us to collect data from official documents (including memoranda of association, balance sheets, appointments of directors, etc.) provided to the courts by firms of any legal type (general partnerships, limited partnerships and companies, cooperative firms, etc.), created or/and operating in Southern Italy. This source represents the starting point from which to trace the subsequent research pattern for integrating the database with information deriving from other (local, national and international) archival sources, grey literature, publications (journals, books, etc.), electronic sources, etc. At present IFESMez contains complete information about 2300 firms – exclusively created and/or operating in Naples and its provinces – and almost 12,500 people for the entire two periods 1808–1873 and 1883–1888 and for the years considered in the article.²³ This database links:

- actors to firms through relations based on actors' roles within firms themselves, such as partner, shareholder, director, auditor (members of the Collegio dei Sindaci), banker, notary, high level technician (e.g. director general);
- actors to actors through relations based on kinship and personal ties;
- firms to firms through all forms of documented relations (cross-shareholding, other kind of ownership ties [e.g. mergers and acquisitions, etc.], debt/credit relations, commercial relations, etc.).

Thus, IFESMez structure allows us to extract data which is to be treated according to the especially fruitful approach to the SNA which combines the different conceptualisations of interpersonal and intercorporate theoretical approaches to interlock networks.²⁴ This interpretative perspective, indeed, taking up both the two approaches of class cohesion and finance capital,²⁵ suggests the relevance both of personal and capital relations – as ‘the principal control relations that surround enterprises’²⁶ – in analysing the wider social and economic networks in which firms are embedded, even in the case of transnational corporate networks and corporate elites.

The dataset extracted for this article includes all the existing actor-to-firm and firm-to-firm relations, recorded in IFESMez, between 1845 and 1919 (that is from the first record concerning CNG’s founders to the acquisition of CNG’s majority stake by SME). This dataset includes a total of 13,425 records covering the entire period.²⁷ After data have been analysed on the basis of the reconstruction of the historical process relative to the case study,²⁸ only four crucial years have been selected (1862, 1874, 1903 and 1914) in order to visualise the evolutionary dynamics of the network surrounding the Naples energy business through SNA tools:²⁹ 1862, CNG’s foundation; 1874, 1903 and 1914, crucial restructuring processes in the organisation and functions within the network. The dataset used actually includes 860 records, regarding all firms (170) and all actors (310) involved within CNG/SME’s network.³⁰

To provide a fairly clear overview of the complexity of the system the article addresses, network visualisation has been produced by loading the dataset in Ucinet6.³¹ To represent ties among actors and firms, two-mode matrices (affiliation matrices) have been built, describing ties between the two sets of items in terms of affiliation (which actors are affiliated with which firms). Then, one-mode matrices (adjacency matrices) have been extracted (from the two-mode ones) defining co-affiliation data regarding actor-by-actor and firm-by-firm matrices, in order to highlight sets of relations connecting actors to actors and firms to firms. Then, after having visualised network graphs, developed thanks to Netdraw, the texture of connections both between actors and between firms have been completed by including arrays of variables describing both attributes and relational properties of the nodes, relative to kinship ties between actors and ownership or credit/debit ties between firms (extracted from IFESMez).

3. CNG: a strategic node in the structuring of an international business group over Italian political Unification (1860–1866)

Founded in 1862, CNG was a joint stock public utility company for Naples gas lighting and heating supply. It aimed at expanding gas lighting throughout Naples by acquiring the assets of the pre-existing Lyonnais *Compagnie Pouchaine*, which had been running the very limited gas lighting business in Naples since 1841.³² Shaped like a freestanding company, CNG was a French-directed Neapolitan-registered company:³³ it had its legal domicile in Naples (i.e. host country), according to what the local municipality had demanded, and its head office in Paris (i.e. home country), where the Board of Directors regularly met.³⁴ Paris had indeed become the leading European financial place for underwriting and quoting public utilities’ financial assets within an area that was progressively being integrated with the French bimetallic system (Latin Monetary Union, 1865) as well as the shaping of the administrative system.

It was in Paris that, within the 2nd Empire industrial and financial environment, the CNG project was developed, thanks to French, Belgian and Swiss investors: the Paris-based general

Table 1. Initial capital from the CNG Statute.

'1) M. B. Parent en sa qualité d'un des gérants de la maison <i>Parent Schaken et Cie</i> , actions	2.845
2) M. Auguste Dassier	600
3) M. Vincent Dubochet	600
4) MM. <i>Parent Schaken et Cie</i> au termes de l'article 6 des présents statuts, pour paiement de la somme de 250.000 francs, entièrement libérées	500
5) les autres actions sont réservées à l'ancienne Compagnie Lyonnaise du Gaz de Naples, en paiement de la concession particulière de ses usines, terrains, canalisations, édifices, matériel, appareils, mobilier etc., aussitôt qu'elle en aura fait à la Compagnie anonyme le régulier abandon et cession et ces actions seront aussi entièrement libérées	455
TOTAL	5.000

Note: The CNG's initial capital was 2.5 million francs, in 5,000 shares, single nominal value 500 francs. Source : Compagnie Napolitaine d'éclairage et de chauffage par le gaz, Statuts, Paris, Imprimerie Centrale des Chemins de Fer de Napoléon Chaix et C.ie, 1863, art. 6 and 7.

partnership *Parent Schaken et Cie* (P&S) – led by the two Belgian entrepreneurs Basile Parent and Pierre Schaken respectively related to the Paris and Brussels financial *milieu*³⁵ – and two Paris-based Swiss businessmen, Vincent Dubochet and Auguste Dassier, both of them linked to the *Parisienne du Gaz* (1855), the Paris big monopolistic gas company, prototype of the groundbreaking financial, technical and contractual innovation in the French gas sector (Table 1).³⁶

On the model of this leading company, CNG, from its beginnings, operated as a monopolist within its exclusive supply area (i.e. the whole of the city), thanks to the concession contract negotiated with the Naples municipality. This contract provided for CNG to build gas plants and a distribution system (with the exclusive rights to lay underground pipes), to operate these facilities for 60 years and then to transfer them to the Naples municipality. Indeed, according to the concession system 'à la française',³⁷ the infrastructures property was ascribed to the local authority, while the infrastructure construction and exploitation was granted to the contractors for a lapse of time which could allow them to recover their investment (i.e. capital and interest), according to the tariffs established by the contract itself (i.e. the tariffs levied on users). Thus – differently from the English system, wherein gas works were part of the industrial activity and infrastructure property pertaining to the companies' assets – CNG's concession contract was a form of project financing aimed to finance the utility project. Monopoly was indeed part of the guarantees which could accompany this kind of public utilities contracts in order to grant fixed capital, including interest, to be recovered through cash flows. According to this system, CNG's contract provided it with pre-emption rights on future changes in urban lighting supply brought by technological innovation.³⁸

Therefore, given the financial specificity of the concession agreement and the capital-intensive nature of the big public utility companies, the promoters' capability to draw on a broad range of financial instruments and markets became crucial for public authorities to select appropriate concessionaires.³⁹ In the Naples case, the gas concession was granted to the P&S which was considered one of the leading French public utility venture promoters with a solid financial expertise.⁴⁰ This partnership had carried out broad and coordinated lines of investments in different business fields since the late 1840s, and – more than a decade later, when it came and invested in Italy – it was at the height of its expansion.⁴¹ This construction firm – according to the *Crédit Mobilier* investment style – had indeed widened

Table 2. Overview of the diversified businesses/firms, promoted or bound to the P&S.

Firms	Sector of activity	Type of contract	Headquarters	Year	Founders/Directors (the only ones who are functional to understanding the P&S network)
Compagnie du Chemin de Fer du Nord	Railways	Joint-stock Company	Paris	1845	Dassier Auguste, de Rothschild frères, Delahante Boykette et Cie, Ferrari duc de Galliera, Gabriel Odier et Cie, Hottinguer et Cie, Laffitte Blount et Cie, Mallet Louis Jules, Parent Basile, Pereire Emile
Compagnie du chemin de fer de Paris à Lyon	Railways	Joint-stock Company	Paris	1846	Baring brothers & C, Bartholony frères, Dassier Auguste, de Rothschild frères, Delahante Boykette et Cie, Ferrari duc de Galliera, Gabriel Odier et Cie, Hottinguer et Cie, Laffitte Blount et Cie, Lebeuf Louis Martin (Lebeuf de Montgermont's father), Paccard Dufour et Cie, Parent Schaken et Cie, Pereire Isaac
Compagnie des chemins de fer de Lyon à Avignon	Railways	Joint-stock Company	Paris	1852	Blount Edward, Brassey-Peto-Betts, Parent Schaken et Cie, Schneider et Cie, Talabot Paulin
Chemin de fer de Cordoue à Seville	Railways	Joint-stock Company	Paris	1853	Manby Édouard, Parent Basile, Talabot Paulin
Compagnie du chemin de fer Grand-Central de France	Railways	Joint-stock Company	Paris	1854	Chatelus Benoit Charles Antoine, Daru Paul, de Morny Charles, Delahante Adrien, Delahante Gustave, Donon Aubry Gautier et Cie, Ferrari duc de Galliera, Fould et Fould Oppenheim, Parent Schaken et Cie, Pereire frères, Société générale du Crédit mobilier
Chemin de fer de Lyon à Genève	Railways	Joint-stock Company	Paris	1854	Bartholony François, Blount Edward, Kohler Christian, Parent Schaken et Cie
Compagnie des chemins de fer de l'Est	Railways	Joint-stock Company	Paris	1855	Dubochet Vincent, de Rothschild James, Ferrari duc de Galliera, Parent Schaken et Cie, Pereire Emile
Compagnie du chemin de fer de Cordoue à Séville	Railways	Joint-stock Company	Madrid/Paris	1857	duc Decazes, Laffitte Charles, Parent Schaken et Cie, Pereire Eugène, Pereire Isaac
Compagnie du chemin de fer Paris-Lyon-Méditerranée-PLM	Railways	Joint-stock Company	Paris	1857	Bartholony François, Benoist d'Azy, Blount Edward, Dassier Auguste, de Rothschild James, Ferrari duca di Galliera, Hottinguer Jean Henry, Mallet Charles, Parent Basile, Pereire Isaac, Schaken Pierre
Compagnie Centrale pour la construction et l'Entretien de Matériel de Chemins de Fer	Railway equipment	Joint-stock Company	Brussels	1858	Oppenheim Joseph, Schaken Pierre
Société Générale de Crédit Industriel et Commercial (CIC)	Bank	Joint-stock Company	Paris	1859	de la Bouillerie Joseph Marie, De Morny Charles, Dehaynin Gabriel, Delahante Fernand, Delahante Gustave, Donon Armand, Lichtlin Edouard, Parent Basile, Rostand Albert

(Continued)

Table 2. (Continued).

Firms	Sector of activity	Type of contract	Headquarters	Year	Founders/Directors (the only ones who are functional to understanding the P&S network)
Mines de los Santos (then Belmez)	Mines	Joint-stock Company	--	1862	Parent Schaken et Cie (buyers)
Concessione rete di ferrovie da Napoli al Mare Adriatico-Regno Due Sicilie	Railways	Concession contract	Naples	1860	Blount Edward, Brassey Thomas, Chatelus Benoit Charles Antoine, Delahante Gustave, Ferrari duc de Galliera, Parent Schaken et Cie, Salamanca José, Talabot Paulin
Concessione rete di ferrovie da Napoli al Mare Adriatico-Regno d'Italia	Railways	Concession contract	Turin	1861	Blount Edward, Brassey Thomas, Buddicom William Burber, Chatelus Benoit Charles Antoine, Delahante Gustave, Ferrari duc de Galliera, Parent Schaken et Cie, Salamanca José, Talabot Paulin
Parent Schaken Caillet et Cie	Mechanical industry	General partnership	Paris, Place Vendôme 12	1861	Blin Eugène, Boisacq Alexandre Prosper, Borguet Henri fils, Caillet Ferdinand Louis Felix, Chèvremont Henry, Delahante Fernand, Delahante Gustave, des Roys marquis Ernest Gabriel, Houel Jules-César, Lavaurs François Louis, Lebeuf de Montgermont Adrien Louis, Parent Schaken et Cie
Compagnie du chemin de fer de Cordoue à Malaga	Railways	Joint-stock Company	Malaga/Paris, Place Vendôme 12	1861	Cail Jean François, Lavaurs François Louis, Lebeuf de Montgermont Adrien Louis, Parent Schaken et Cie, Stevens Oscar, Vitali Philippe
Compagnie du chemin de fer de Ciudad Real à Badajoz	Railways	Joint-stock Company	Madrid/Paris, Place Vendôme 12	1861	Blin Eugene, Blount Edward, duc Decazes, Lavaurs François Louis, Lebeuf de Montgermont Adrien Louis, Parent Schaken et Cie
Società generale immobiliare di lavori di utilità pubblica e agricola (SOGENE)	"Travaux publics"	Joint-stock Company	Turin	1862	Blin Eugene, Meuricoffre Oscar, Bolmida Vincenzo, Briganti Bellini Bellino, Cahen d'Anvers Joseph Edouard, De Lannoy Jean Edouard, Getti Adolphe, Lavaurs François Louis, Parent Basile, Oppenheim Joseph, Schaken Pierre
Compagnie Napolitaine d'éclairage et de chauffage par le gaz (CNG)	Gasworks/gas heating-lighting	Joint-stock Company	Naples/Paris, Place Vendôme 12	1862	Balsamo Luigi, Dassier Auguste, de Boissieu Alphonse, de Gayffier Eugène Josef, de Martino Giacomo, Dubochet Vincent, duc Decazes, Hémary Emile, Lavaurs François Louis, Lebeuf de Montgermont Adrien Louis, Martino del Tufo Mario, Meuricoffre Oscar, Parent Schaken et Cie, Raoul Duval Fernand
Société générale des chemins de fer romains	Railways	Joint-stock Company	Rome	1862	Benoist d'Azy Denys, Briganti Bellini Bellino, Chatelus Benoit Charles Antoine, Daru Paul, de la Bouillierie Joseph Marie, de la Ferronay Charles, de Martino Giacomo, Delahante Fernand, Delahante Gustave, Lebeuf de Montgermont Adrien Louis, Lichtlin Edouard, Mires Jules, Parent Schaken et Cie, Salamanca José
Vitali Charles Picard et Cie 1862	"Travaux publics"	"Société en commandite"	Paris, Place Vendôme 12	1862	Charles Joseph Sébastien, Parent Schaken et Cie, Picard Firmin, Stevens Oscar, Vitali Philippe

(Continued)

Table 2. (Continued).

Firms	Sector of activity	Type of contract	Headquarters	Year	Founders/Directors (the only ones who are functional to understanding the P&S network)
Compagnie Générale de Chauffage et d'éclairage par le gaz	Gasworks/ gas heating -lighting	Joint-stock Company	Brussels	1862	Errera Jacques, Oppenheim Joseph, Reinach Adolphe, Schaken Pierre
Compagnie de l'Ouest des chemins de fer Suisses	Railways	Joint-stock Company	Lausanne	1863	Aubert Louis, Blin Eugène, Bonna Isaac, Dubochet Vincent, Lavaurs François Louis, Lebeuf de Montgermont Adrien Louis, Odier James, Parent Schaken et Cie, Pereire Emile, Pereire Eugène
Compagnie du chemin de fer direct de Bruxelles à Lille à Calais	Railways	Joint-stock Company	Brussels	1863	Blin Eugène, Oppenheim Joseph, Schaken Pierre
Società italiana Strade ferrate Meridionali	Railways	Joint-stock Company	Turin	1864	Balduino Domenico, Bastogi Pietro, Belinzaghi Giulio, Bombrini Carlo, Carlo de Fernex et C., Cassa del Commercio e dell'Industria (then Credito Mobiliare Italiano), Cavajani Oneto et C., De la Rue et C., Parent Schaken et Cie, Ulrich et C., Weil Weiss Ignazio, Zaccaria Pisa
Banca di Credito Italiano	Banca	Joint-stock Company	Turin	1864	Aubry Felix, Blin Eugène, Bolmida frères, Briganti Bellini Bellino, Chatelus Benoit Charles Antoine, Daru Paul, de la Ferronay Charles, Dehaynin Gabriel, Delahante Gustave, Donon Armand, Donon Aubry Gautier et Cie, Emery Louis, Filangieri Giovanni, Getti Adolphe, Gladstone William, Lavaurs François Louis, Levi Felice e C, Lichtlin Édouard, Parent Basile, Roberti Jean Albert, Rostand Albert, Sautter frères
Société Générale (pour Favoriser le Développement du Commerce et de l'Industrie en France)	Bank	Joint-stock Company	Paris	1864	Arlès Dufour François Barthélemy, Bartholony Jean François, Benoist d'Azy Denys, Bischoffsheim Jonathan Raphaël, Bischoffsheim Louis Raphaël, Blount Edward, Brasse Thomas, Buddicom William Burber, Cahen d'Anvers Meyer Joseph, Daru Paul, Dubochet Vincent, Hentsch Isaac Edouard, Mirabaud Henry Louis, Parent Basile, Pinard Alphonse Louis, Schneider Joseph Eugène, Talabot Paulin
Compagnie de Fives Lille	Mechanical industry	"Société à responsabilité limitée"	Paris, Place Vendôme 12	1865	Blin Eugène, Boisacq Alexandre, Borguet Henri, Caillet Ferdinand Louis Félix, Chevrement Henry, des Roys marquis Ernest Gabriel, Houel Jules César, Lavaurs François Louis, Lebeuf de Montgermont Adrien Louis, Parent Schaken et Cie
Parent Schaken et Cie dissolution				1866-90	

Source: Database IFESMEZ.

its interests to different countries, into companies of different sectors such as mining, metallurgy, mechanical industry, banking, real estate, gas lighting, a diversified investment pattern which had increasingly pushed its expertise towards the financial function. In 1862, the P&S concretely functioned as a venture capitalist. Keeping locked the narrow edge of the parent partnership, with few partners bound to each other by long-term business and kinship ties, it raised finance to spin-off separately quoted new companies on main financial markets. For the specific venture of CNG, the P&S hooked the complementary technological and financial expertises in the gas sector by joining the then President of the *Parisienne du Gaz* Vincent Dubochet and the Swiss banker Auguste Dassier, in his turn tied to the Swiss gas businesses.⁴² Thus, since its creation, CNG was part of a wide context of inter-firm and inter-actor relationships transversal to local and global space, rather than a clear-cut entity.

Table 2 (that summarises the period of the P&S from 1845 until its dissolution in 1866) is an extract of the above described dataset. It gives an extensive overview of the diversified businesses/firms, which, starting from the 1860s, shaped as a business group 'consisting of legally independent firms'⁴³ clustered around the P&S, which CNG became an integral part of.

Figure 1, and its detailed version in Figure 2, gives a snapshot of how the network was structured at 1862. Within the graphs, by detecting an attribute-defined group, a core network of clustered firms has been highlighted having their head office in Paris (Figures 1 and 2 – black square nodes), at the legal domicile of the parental partnership P&S (12 Place Vendôme). As documents reveal these firms – geographically scattered in France (*Vitali, Charles, Picard et C.ie* and *Parent Schaken Caillet et Cie* [then *Fives-Lille*]), Spain (*Chemin de fer de Cordoue à Malaga, Chemin de fer de Ciudad Réal à Badajoz, Mines de Los Santos* [then *Belmez/Peñarroya*]) and Italy (*SOGENE*⁴⁴ and *CNG*) – were directly promoted and co-owned by P&S. For the Spanish and the Italian ones, formed as limited companies, the core firm P&S acted as the access point to international financial markets. Among the other firms surrounding this core cluster, the *Paris-Lyon-Méditerranée* (PLM) (1857) and the *Crédit industriel et commercial* (CIC) (1859) had been strategic in structuring those long-lasting relationships which had brought Basile Parent in Italy (Table 2).⁴⁵ The PLM had indeed allowed Parent to tighten his relationships with the Geneva financial place and with Auguste Dassier. The CIC, while widening Parent's capabilities in raising finance by entering the process of credit institutionalisation, allowed him to strengthen his pre-existing ties with the financial group (Morny–Donon–)Delahante, already operating in the Italian Roman Railways (Table 2 and Figure 1 and 2).⁴⁶

Thus, as data reveal, the Naples gas investment came from pre-existing intercorporate and interpersonal ties, respectively in the form of ownership relations, interlocking directorships and kinship ties. Figures 1 and 2 highlight the co-ownership ties (black links) between the P&S partners undergirded by cohesive kinship relations linking some of them.⁴⁷ Kinship ties also strengthened the actor–firms core network clustered around the P&S. This is clearly shown by Figure 3 (actor-by-actor matrix extracted from the firm-actor matrix) which highlights kinship attributes of significant nodes among which the P&S partners and CNG co-founders (P&S and Dassier) (black circle nodes Parent and Schaken's family;⁴⁸ black square nodes Lavaurs' family; black uptriangle nodes Dassier's family). Within the narrow and dense P&S' network, interlock ties, undergirded by kinship relations, were thus the key element to maintain a direct control over the partly owned companies, among which was CNG.

This way, CNG's governance structure was designed to ensure the three co-founders nodes P&S, Dubochet and Dassier could keep the control of the company nearly unchanged

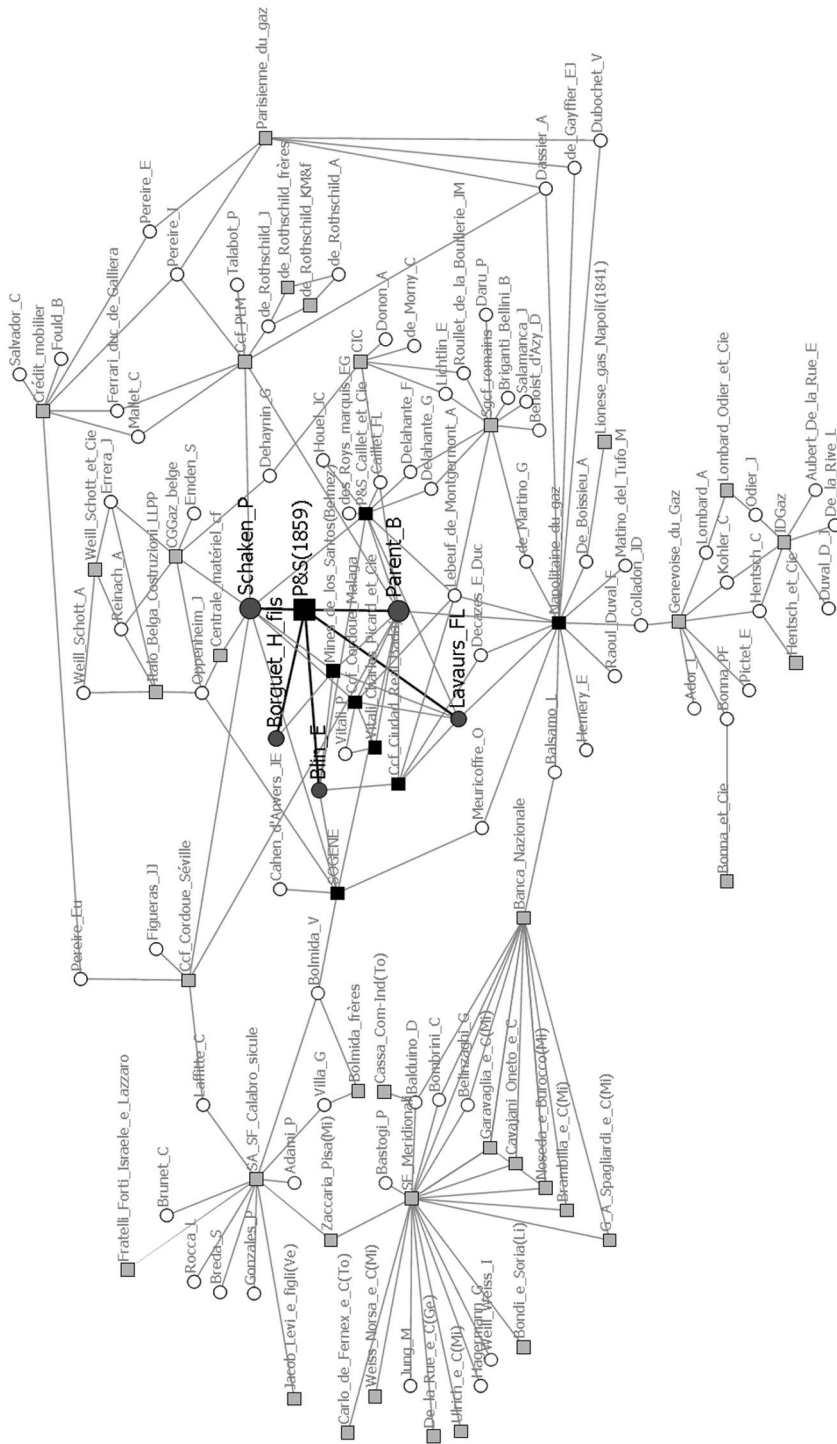


Figure 1. CNG's actor/firm network – 1862. Source: Database IFFESMEZ. Note: 2 mode network - visualisation of sets of relations connecting actors and firms (actor/firm matrix). Circle nodes; actors; square nodes; firms; Black square nodes: firms with the administrative headquarters in Paris, at the P&S's legal domicile, 12 Place Vendôme; largest node: parent partnership of the business group. Black links and grey circle nodes: P&S's partners; different size of grey circle nodes according to nbetweenness values.

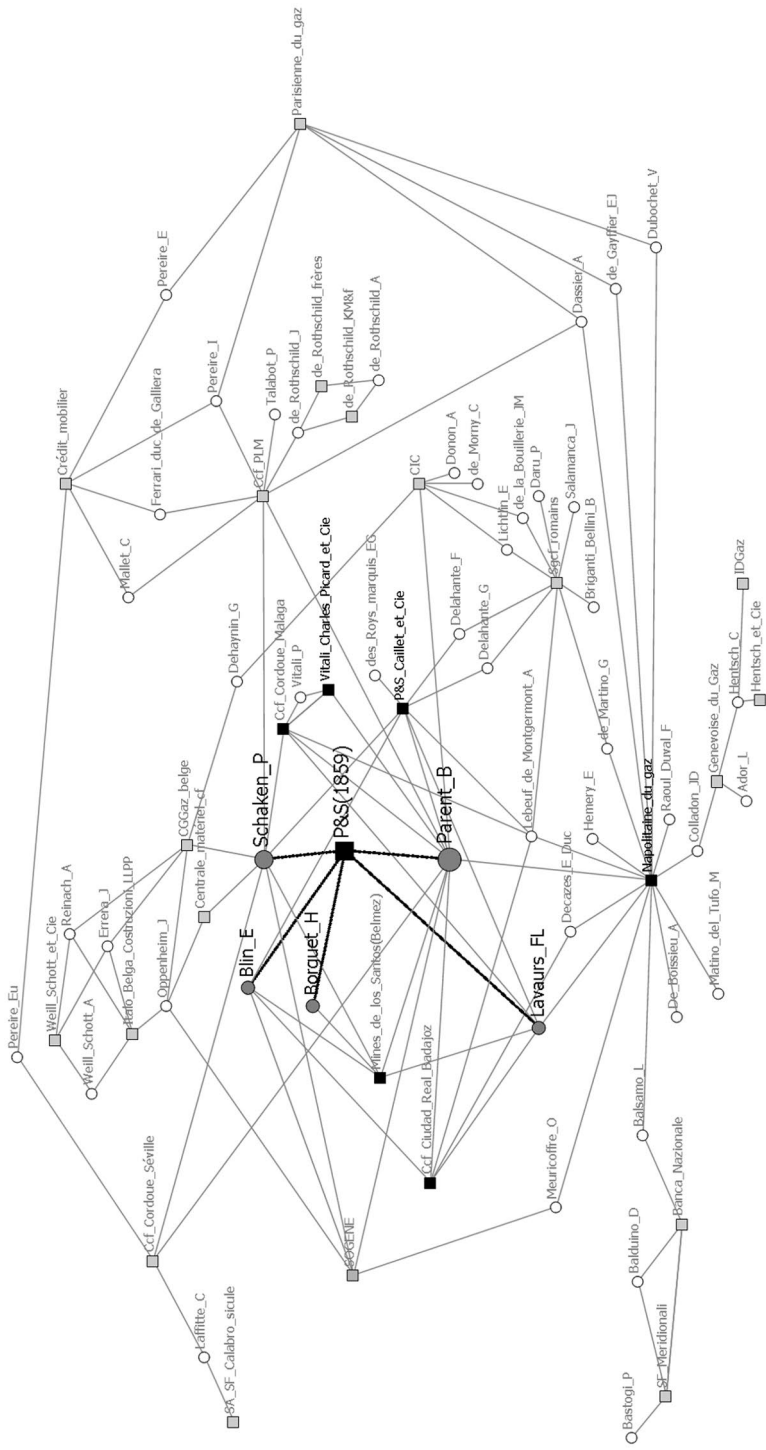


Figure 2. Detail of Figure 1 – CNG's actor/firm network – 1862. Note: P&S's core network (see Figure 1).

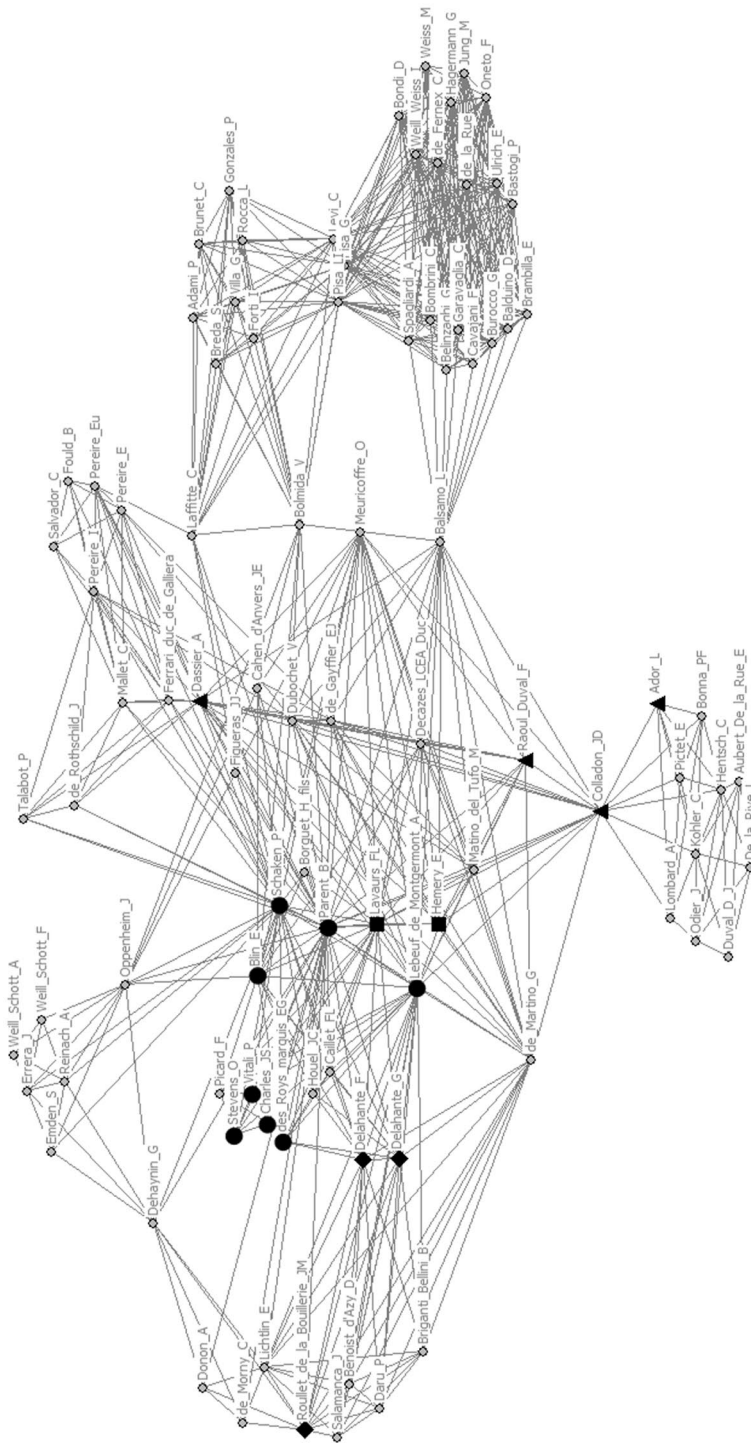


Figure 3. CNG's actor/network with details on kinship ties – 1862. Source: Database IFESMEZ. Note: 1 mode network - visualisation of sets of relations connecting actors and actors via their co-membership/co-attendance at the same firms (actor/actor matrix). All the nodes represent actors. Black circle nodes: Parent and Schaken's family nodes; black square nodes: Lavaurs' family nodes; black uptriangle nodes: Dassier's family nodes; black diamond nodes: Delahante's family nodes.

during the time (see Table 3). These three groups cooperated on different basic functions, by integrating their specific capabilities for the exploitation of the gas business. In 1862, the P&S group centralised the political function, aimed at forging relationships both with local actors and authorities and the financial function as well; while the group Dubochet/*Parisienne du gaz* principally managed the technical function by cooperating with the Dassier group linked to the technical and financial know-how of the Geneva gas business, via the Swiss engineer Daniel Colladon (linked by kinship ties to Dassier), who planned and supervised the construction of CNG plants.

On the other hand, local directors always had a subordinate role in the company's decision-making processes,⁴⁹ even if, despite their complementary role, the actors composing the small Neapolitan committee always represented strategic nodes of different networks of relationships which enriched the cluster of actors and firms surrounding CNG, linking it to the local/national financial and business environment. The reference is to the politician Giacomo de Martino who, since 1860, had played a role in connecting the P&S financial interest to Southern Italy railway investments,⁵⁰ the Swiss-Neapolitan banker Oscar Meuricoffre, who was a co-founder of the SOGENE⁵¹ and the merchant businessman Luigi Balsamo who was bound to the *Banca Nazionale*, the most important Italian issue bank (Figure 1).

Up until to 1866, when Basile Parent died suddenly and the P&S was put into a voluntary liquidation, the P&S had the most prominent role within CNG's governance system, leading the company to strengthen its local monopoly position while progressively worsening its relationships with the Naples municipality. Indeed, CNG obtained new gas lighting concessions in Salerno and Castellammare which entailed new financial efforts,⁵² for which the P&S exploited its important financial links with the *Banque de Bruxelles* (Brussels), the new-born *Crédit Lyonnais* (Lyon) and the Swiss *Bonna et Cie* (Geneva).⁵³ At the same time, problems of opportunistic behaviour both by CNG's managers and local political actors related to problems of bound rationality of the public administration occurred, in relation to the complex transaction of the 1862 concession agreement. CNG underwent a legal procedure in the charge of having extracted monopoly rents thanks to the 'leonine pacts' included within the contract, thus highlighting the speculative and collusive nature of the P&S political and financial leadership.⁵⁴

4. Investment slowdown and changing ties on the threshold of the electric power breakthrough (1866–1891)

The year 1866 ushered in a period of instability when a time of transformation arrived at several levels. The national and international trend rapidly changed: the 1866 financial crisis entailed a *flight-to-quality* effect involving the discredited Italian financial assets and the introduction of the regime of fiat money; the 1870 Franco-Prussian War progressively changed the Italian international political references. This changing context, together with the death both of Basile Parent and Pierre Schaken (1870), greatly affected the organisational dynamics of the business group clustered around the P&S, whose central node was definitely dissolved. New patterns and changing relations – passing through pre-existing ties – were drawn, hence deeply transforming the network structure.

Figure 4, relative to 1874, gives a clear vision, if compared with Figure 1, of how this transformation took shape in the course of about 10 years. The dissolution of the core partnership had entailed a deep reorganisation within the P&S' clustered firms and the

Table 3. Board of Directors of CNG, 1862–20.

Directors	Nationality	Profession	Role	Length of role
P&S GROUP				
Parent Basile	Belgian	Entrepreneur	P	1862–66
Borguet Henry	Belgian	Entrepreneur	D	1863–70
Lebœuf de Montgermont Andrien	French	Landowner	D	1862–76
Lavaurs François	French	Entrepreneur	VP/P	1862–84
Lavaurs Eugène	French	Landowner	D	1866–89
Lavaurs Raymond	French	Businessman	D/VP	1885–1919
Bertrand-Geslin Lucien	French	Landowner/businessman	D	1891–1902
Hémery Emile	French	Entrepreneur	GM	1862–1881
Krafft Victor	German	Engineer	GM/D	1881–94; 1894–1901
DUBOCHET GROUP				
Dubochet Vincent	Swiss	Entrepreneur	D/P	1862–77
De Gayffier Jules	French	Engineer	D	1862–71
Pernolet Nicholas	French	Engineer	D	1871–88
Guichard Jules	French	Politician/Businessman	D/CEO/ VP/P	1872–95
Camus Emile	French	Engineer	D/CEO/P	1875–1908
Cabarrus Robert	French	Public Officer	D/CEO	1878–1903
Pérouse Denis	French	Engineer	D/P	1887–1919
De Gayffier Eugène	French	Public Officer	D	1887–1908
Pernolet Arthur	French	Engineer	D	1888–1915
Guichard Robert	French	Businessman	D	1896–1919
DASSIER GROUP				
Dassier Auguste	Swiss	Banker	D	1862
Raoul-Duval Fernand	French	Engineer	D/VP/P	1862–92
Duc Decazes Louis-Charles	French	Mining entrepreneur and Statesman	D	1862–68; 1884–86
Colladon Jean Daniel	Swiss	Engineer	D	1869–92
Comte Edmond	French	Employer	D/CEO	1870–84
Raoul-Duval René	French	Engineer	D	1889–1915
Ador Gustave	Swiss	Banker and Statesman	D/VP	1892–1917
Aubert Edmond	Swiss	Engineer	D	1892–1919
Hentsch Ernest	Swiss	Banker	D	1896–1900
Bouvier Barthélemy	Swiss	Banker	D	1900–20
Mirabaud Jean	Swiss	Banker	D	1915–20
Bordier Pierre	Swiss	Banker	D	1915–20
Chavanne Louis	Swiss	Engineer	GM	1917–19
EX COMPAGNIE POUCHAINE				
De Boissieu Alphonse	French	Landowner	D	1862–88
NEAPOLITAN COMMITTEE				
Meuricoffre Oscar	Swiss-Neapolitan	Banker	D	1862–69
De Martino Giacomo	Neapolitan	Statesman	VP	1862–70
Matino del Tufo Mario	Neapolitan		D/VP	1862–85
Balsamo Luigi	Neapolitan	Merchant	D/VP	1862–73
Auverny Jean	Swiss-Neapolitan	Banker	D	1873–74
Cilento Antonio	Neapolitan	Merchant	D/VP	1870–90
Persico Leopoldo	Neapolitan	Lawyer	D/VP	1876–96
Cacace Giulio	Neapolitan		D	1886–91
De Siervo Fedele	Neapolitan	Statesman	D	1891–1913
ITALIAN DIRECTORS (1920)				
Carbonelli Pio, baron	from Caserta	Statesman	P	1920
Belleni Silvio	Italian	Admiral	D	1920
Colosimo Gaspere	Calabrian	Statesman	D	1920
Ferretti Giacomo	Roman	Businessman	D	1920
Grippo Pasquale	from Lucania	Statesman	D	1920
Maggioni Luigi Gustavo	from Emilia	Engineer and Businessman	D	1920
Marino Eduardo	Neapolitan	Lawyer and Businessman	D	1920

Note: D = Director; P = President; VP = Vice-President; CEO = Chief Executive Officer; GM = (local) General Manager. Source: Database IFESMEZ.

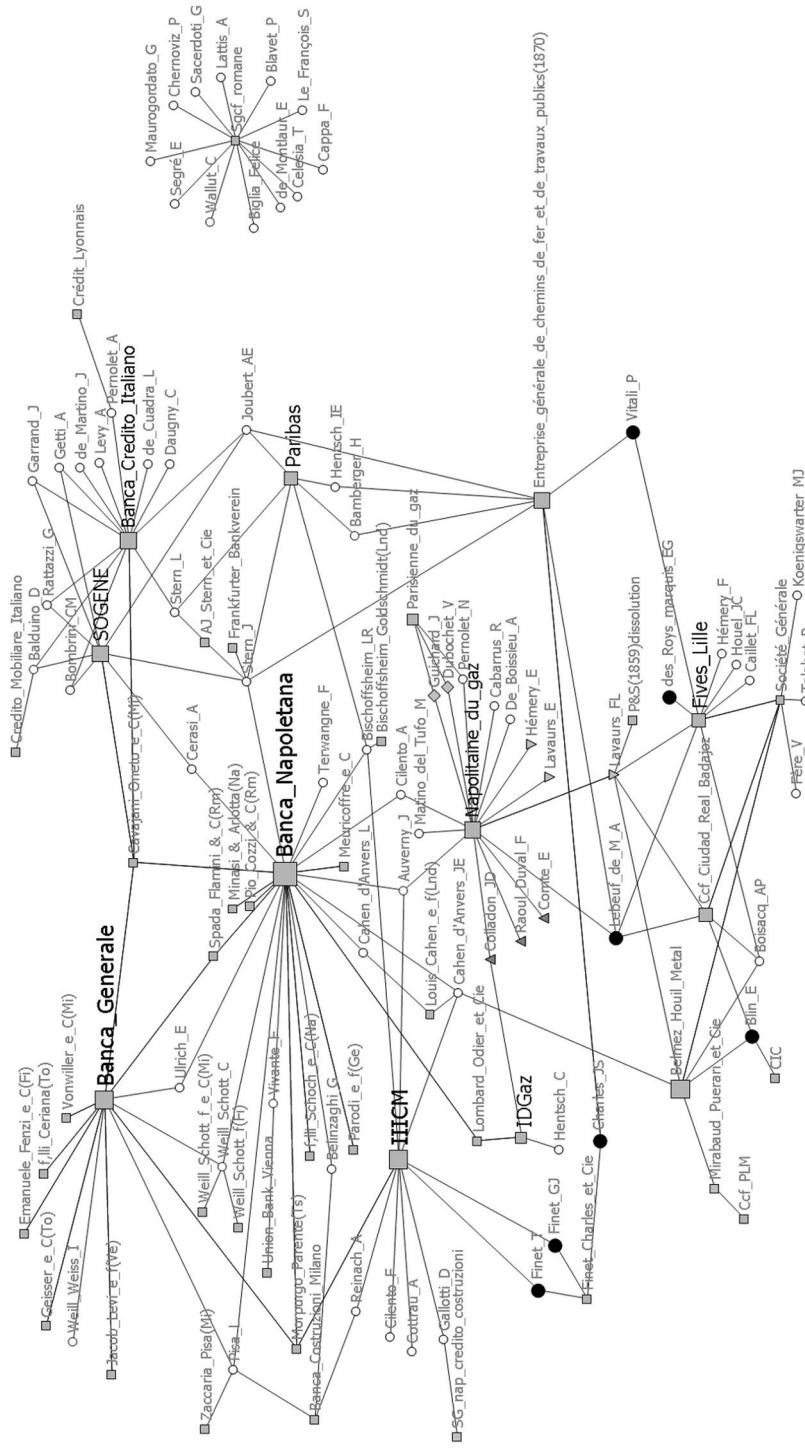


Figure 4. CNG's actor/firm network – 1874. Source: Database IFESMEZ. Note: 2 mode network - visualisation of sets of relations connecting actors and firms (actor/firm matrix). Circle, upright triangle and diamond nodes: actors; square nodes: firms; different size of the nodes according to nbetweenness values. Black circle nodes: Parent's heirs; diamond nodes: Dubochet's kinship ties; down triangle nodes: Lavaurs' kinship ties; up triangle nodes: Dassier's kinship ties.

establishment of new financial relations to support the linked firms, including CNG. Indeed, the previous P&S' functions shifted towards different financial institutions linked to the group through pre-existing ties, and new big banks joined the network both at international and national level.

On the Paris financial place:

- the steelworks company *Fives-Lille* – wherein both Parent's heirs (black circle nodes) and the remaining P&S' partners kept joined together – and the P&S' integrated Spanish businesses (*Chemin de Fer Ciudad Real Badajoz*; *Mines de Belmez*, ex *Mines de Los Santos*)⁵⁵ gained the financial support of the *Société générale*, with which Basile Parent had established previous co-ownership ties since its foundation in 1864⁵⁶ (Figure 4, lower part);
- the *Entreprise générale de chemins de fer et de travaux publics* (1870) – resulting from the reorganisation of the P&S group's railway businesses, carried on by Philippe Vitali (husband of the Parents' niece, Marie Orthense Finet) and supported by the Parents' heirs, via Lebeuf de Montgermont (Parent's son-in-law) – established a financial link with *Paribas* (1872), deriving from the previous co-ownership ties between the *Entreprise générale* and the two *Paribas* co-founders, *Banque de Crédit et de Dépôt des Pays-Bas* and *Banque de Paris* (Figure 4, lower right side);
- the former CIC-P&S' Turin-based businesses, the SOGENE and the *Banca di Credito Italiano*⁵⁷ established financial relations with *Paribas*, via Edmond Joubert, one of the founders of the *Banque de Paris*.

On the Italian capital markets:

- the SOGENE and the *Banca di Credito Italiano* found the support of their new co-owner *Credito Mobiliare Italiano* (1863), which had been created to fund the Southern Italy railway company, *Società per le Strade Ferrate Meridionali*, wherein the P&S had been strongly involved for a long time⁵⁸ (Figure 4, upper right side);
- CNG – through Antonio Cilento and Jean Auverny (members of the local Committee) – established directorship ties with the new-born Neapolitan investment bank *Banca Napoletana* (1871) which had among its founders some *Paribas*' strategic actors (Stern and Bishoffsheim). This way, CNG reconstructed the missing link with Paris financial place (Figure 4, central section). Hence – thanks to former personal and capital network ties – *Paribas*, was going to become a strategic node for the future reshaping of CNG's financial network.

The network restructuring, as above described, resulted in an internal reorganisation of CNG's Board of Directors, in 1871. The small Naples Committee was reduced from four to three directors while a member was added to the Paris Board in order to allow the entry of a director from Geneva 'vu l'importance des intérêts représentés dans cette Ville.'⁵⁹ Really, the link with the Geneva financial place had strengthened since 1865, when the holding *Compagnie genevoise de l'industrie du gaz* (IDG) had got an equity stake of 10% in CNG⁶⁰ (see Figure 4). This ownership tie too came along with the existing kinship relationships between CNG's Dassier group and the Swiss Ador family,⁶¹ via Daniel Colladon and Fernand Raoul-Duvall (uptriangle nodes), widely related to the Swiss *haute banque* and particularly to the Hentschs, who were both co-founders of IDG and core actors of *Paribas*.

The reorganisation of CNG's Board of Directors marked a change in the composition of the dominant groups: both the Dassier group and the group Dubochet/*Parisienne du gaz* increased to the detriment of the P&S group (Table 3). This way, CNG governance and the basic functions progressively moved towards the Swiss component of the company. Fernand

Raoul-Duval, son-in-law of Auguste Dassier (and also related with the Adors) and core node of the Swiss group after the Dassier's death (1862), became a key actor in CNG's changing network. He took over the political function marking an interruption in the P&S style, by trying to re-establish good relationships with the Naples local authorities. Furthermore, he had a strategic role with regard to the financial function as well, which had to become newly strategic when a business recovery phase occurred at the end of the long-lasting period of fiat money (1883).

In 1886, CNG obtained a new concession for Naples 'neighbourhoods' gas lighting and needed to resort to capital markets by issuing new capital.⁶² But an effective sharp acceleration of the financial function was spurred on only by the advent of the electricity which could really jeopardise CNG's monopoly power on the local market, which had been preserved by the 1886 contract. Actually, in the meantime, the technological development of electricity had brought the competition within the energy sources to challenge gas lighting's future,⁶³ thus opening a period of strategy adaptation of the gas industry according to two possible options:⁶⁴

- the development of short-medium term commercial strategies aiming at exploiting plants till the expiration date of concession contracts, paying attention both to lower costs and developing gas uses other than lighting and heating;
- the development of long-term strategies by entering the electricity sector for the integrated exploitation of the two sectors' plants, in which the uses of gas other than for lighting could be combined with coke exploitation (the main by-product of the gas industry) in thermal plants for electricity production.

The last option was the choice made by CNG, thanks to its links to the Swiss bankers. The information advantage of Geneva high finance on the future of the energy sector, deriving from its international calibre, proved to be of critical importance for the company in choosing to diversify its investments in the electricity sector, in 1891.⁶⁵ This choice entailed the realisation of growing capital-intensive investments in order to face the gradually increasing needs and the long-term strategic objectives. This was what progressively made the Geneva financial place emerge as the key organisational core of CNG's financial strategy and CNG's financial function to be seized by the Swiss bankers. On one hand Geneva had emerged as an operative hub of the international *haute banque* since the Franco-Prussian war; on the other hand the Geneva bankers had consolidated their distinctive tradition of cooperation giving rise to the *Union financière* (UF, 1890),⁶⁶ founded by some of the most important Geneva banking houses among which were *Bonna et Cie*, *Darier et Cie*, *Hentsch et Cie*, *Bordier et Cie*, all of whom would then have been directly involved in CNG's financial operations.

The increasing importance of the Swiss component will be evident in the following Figures 5 and 6, concerning another remarkable reorganisation within CNG's network in 1903, when the Swiss component had definitely moved from a peripheral position to the core of the network, according to the increasing role of the Swiss finance within the electricity sector at international level.⁶⁷ The qualitative sources from CNG's archive will be of critical importance in the next section to cast light on the financial strategy which led the Swiss actors to this central position, at the same time keeping unchanged the control on the local energy market.

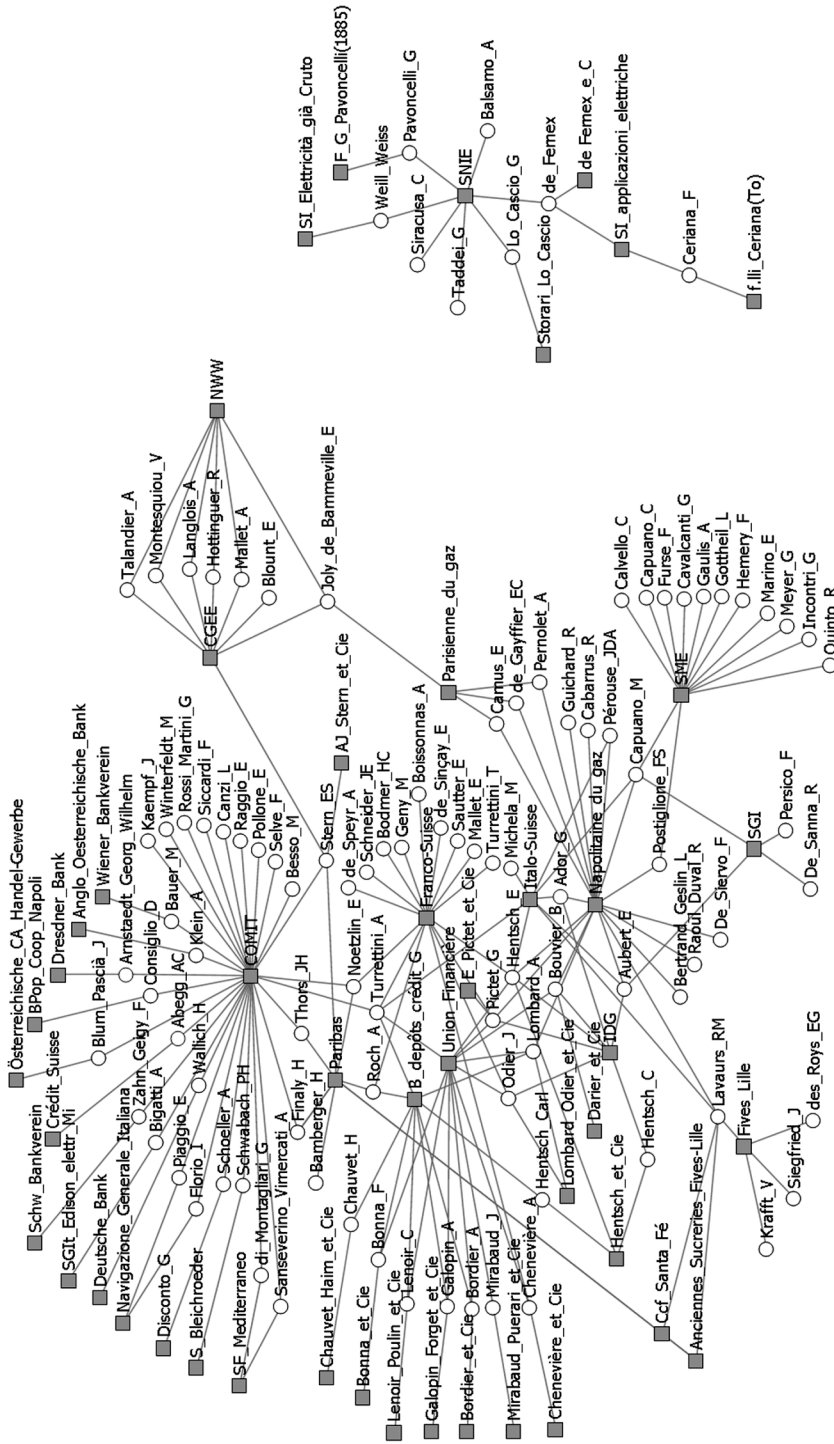


Figure 5. CGNG's actor/firm network – 1903. Source: Database IFESMEZ. Note: 2 mode network - visualisation of sets of relations connecting actors to firms (actor/firm matrix). Circle nodes: actors; square nodes: firms. Black nodes: firms included in the hierarchical scheme in the following figure.

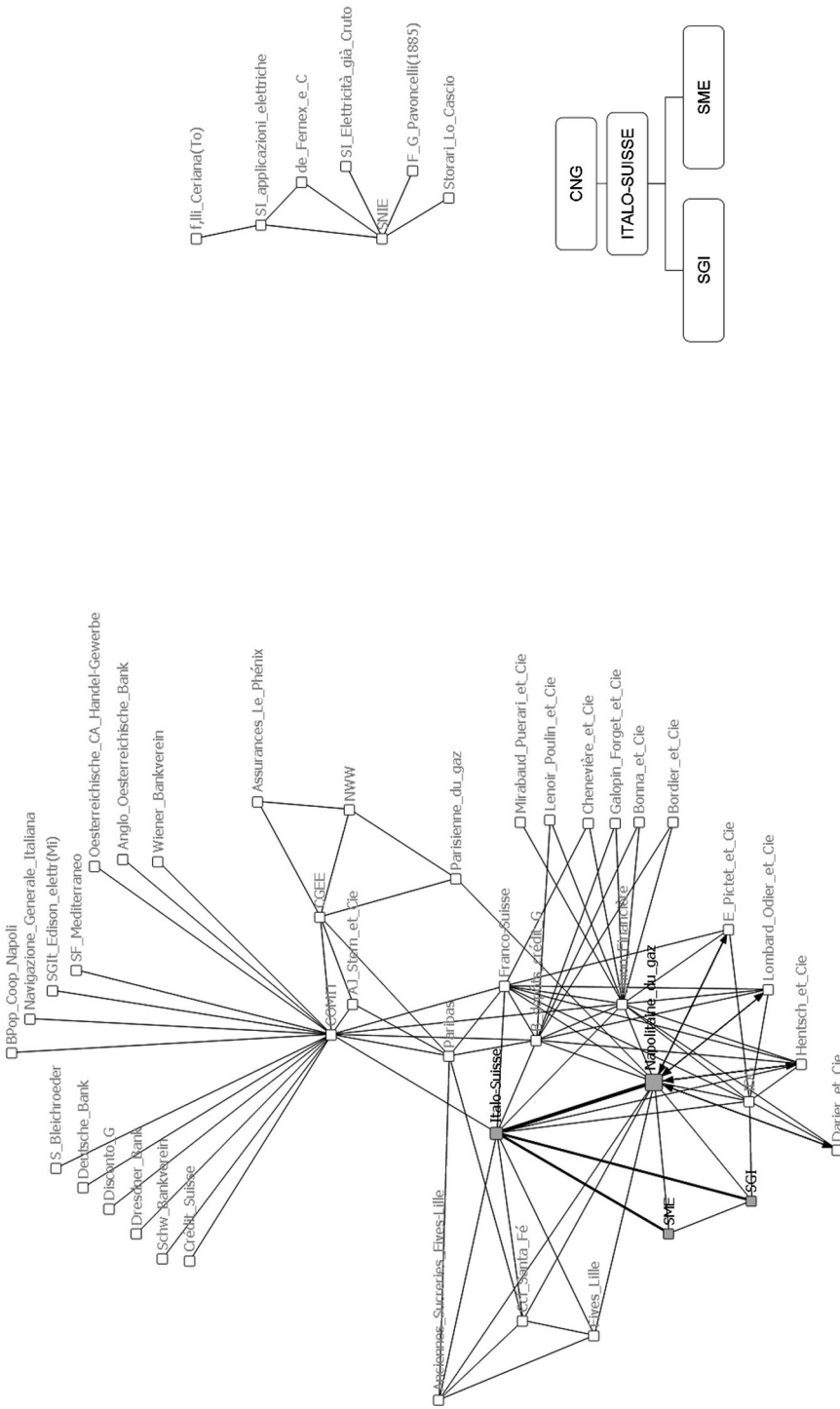


Figure 6. CNG's firm/firm network – 1903. Source: Database IFESMEZ. Note: 1 mode network - visualisation of sets of relations connecting firms to firms via interlocks with shared actors (firm/firm matrix). All the nodes represent firms. Grey nodes and thick links: firms included in the hierarchical scheme on the right side; different size of the nodes according to the firms' position in the hierarchical scheme. Arrows heads links: CNG's debt relations.

5. Competition between energy sources and growing capital needs: towards stronger corporate ties (1891–1902)

The push to move towards the electricity sector was exogenous: it came from the competition within the private lighting sector after the Naples municipality had granted a contract to the Rome-based *Società generale per l'illuminazione* (SGI) (27 December 1890) for the electric lighting of some specific public buildings.⁶⁸

CNG's strategy to maintain the energy market's control and defeat competition was a hostile takeover of SGI,⁶⁹ a process which was slowed down due to the 1893 Italian banking crisis, thereby entailing higher costs for the acquisition of the target company and a consequent strong financial effort for CNG. The capital increase of 1891 (from 6 to 7.5 million lira) was not sufficient to hurdle the problems for entering the new sector and new high debt exposure was necessary. It was faced by drawing even more on the Geneva financial place (*Bonna et C^e*, IDG, *Banque Genevoise de Prêts et Dépôts* [BGDP])⁷⁰ with a consequent further strengthening of the Swiss finance role within CNG's Board. Indeed, the political function was taken over by Gustave Ador⁷¹ (Colladon's nephew) – CEO of the *Genevoise du gaz* and Director of IDG – who entered CNG's Board in 1892. Furthermore, the number of Directors was increased from 13 to 14, in order to allow the entry of the Swiss engineer Edmond Aubert, another of IDG's directors.⁷² At the end of 1894, CNG acquired the SGI majority stake (6,386 shares to 6,747 total shares), subscribed the contract for the partial electric lighting of Naples (negotiated with the municipality on 27 November 1894) and entrusted the controlled company (SGI) to carry out the contract.⁷³

At the same time, the SGI's Board of Directors was completely reshaped by CNG: three of CNG's Directors (Victor Krafft, Edmond Aubert and Robert Cabarrus), respectively representing both Genevan and French interests, entered the SGI's Board, while the Neapolitan lawyer Maurizio Capuano was appointed as CEO of the company.⁷⁴ This way, all the strategic decisions for the SGI were taken within CNG's Board of Directors and then only formally confirmed by the SGI via Maurizio Capuano.

In March 1896 a new increase of capital was necessary in order to discharge CNG's short-term debts and thus preserve its reputation for repayment and its credit access on international capital markets. 63% of the capital increase was placed on the Geneva financial market and resulted in a reshaping of CNG's Board.⁷⁵ Gustave Ador was appointed vice-President and Ernest Hentsch⁷⁶ entered the Board.⁷⁷ The latter took the role of financial node and access point to the Geneva financial place.

At the end of the 1890s, a new phase of harsh competition suddenly ignited in the new fields of tramway electric traction and hydroelectricity, also encouraged by the intent of the local authorities to undermine CNG's monopoly power in order to realise lower prices in the energy supply. The Swiss group of CNG prevented negotiations with outside groups: with regard to the electric traction, it hampered the possibility of a Belgian group (bound to the *Banque de Bruxelles*) from gaining access to CNG shareholding and, at the same time, it rejected the German offers for hydroelectricity production and transport.⁷⁸

On 11 July 1898, the holding company *Franco-Suisse pour l'industrie électrique* (*Franco-Suisse*) was founded in Geneva thanks to the cooperation between *Union Financière*, *Bankverein Suisse*, *Crédit Suisse*, *Paribas* and *Banca Commerciale Italiana* (Comit). The *Franco-Suisse* had directorship relations with IDG and CNG through Edmond Aubert and with CNG and the *Union Financière* through Ernest Hentsch. Since its very beginnings, the *Franco-Suisse*

had to become one of the financial key nodes for the new CNG's strategies. At the moment of the *Franco-Suisse* foundation, indeed, CNG launched a wide ranging investment project aimed at acquiring the monopoly both of electricity production and distribution, and beating any business competitor in that market. CNG's project provided for initially putting all the efforts into maintaining the control over the local area (Naples, Salerno and Castellammare) and for subsequently undertaking other business initiatives in Southern Italy, which was opposite to the specific interest of its financial partners. To realise its plan, CNG's General Manager (Victor Krafft) was authorised to research and develop all forms of cooperation in whatever direction: agreements with tram and funicular companies, local railways, and with German producers of electric equipment. For this purpose, a long-term financial plan was launched for 8.9 million lira, to be realised in two steps (1899–1901 and 1901–09), the first one of which, provided for issuing 10,000 new shares to be paid in gold coins. The shares were issued in 1899 and transferred to a selling syndicate represented by *Hentsch et Cie*. This way, the Swiss bankers had definitely taken over the financial function within CNG's Board of Directors.⁷⁹

At the same time, CNG, together with *Franco-Suisse*, *Comit* and a Neapolitan group, founded the *Società Meridionale di Elettricità* (SME) (15 March 1899) for hydroelectric production. CNG's General Manager, Krafft, and Maurizio Capuano, immediately entered SME's Board of Directors and CNG underwrote one-fifth of SME's issued capital while demanding some clauses aimed at granting its pre-emption right on the use of the energy produced within the controlled local area.⁸⁰ Once the abovementioned agreements with CNG's financial partners had been established, then in November 1900 Ernest Hentsch could be replaced by the Swiss banker Barthélemy Bouvier. The latter belonged to the banking house *Darier et Cie* – in its turn associated to the *Union Financière* – and, from this moment on, he would have been the key actor for all the financial agreements on the Geneva financial place.

From 1900 on, the realisation of CNG's monopolistic plan was undermined by the creation of the *Società napoletana per le imprese elettriche* (SNIE, 11 November 1899). It was a Naples-based company through which a group of Piedmontese and Neapolitan bankers and businessmen had entered the local electricity market (Figure 6, isolate node)⁸¹ thanks to a previous government measure (7 June 1894) which had given Prefects the power to authorise the laying of electric distribution lines, in order to foster free competition within the energy sector. SNIE's competition, after an unsuccessful attempt at cooperation,⁸² made CNG's incomes lower, so making it very difficult to realise the second step of its monopolistic plan and further burdening its budgets with increasing debt exposure. New short term loans granted by Swiss finance (*Banque Genevoise de Prêts et Dépôts*, IDG, *Comptoir d'escompte de Genève*, *Banque fédérale de Genève*) and by long-lasting French financial links deriving from the P&S Spanish businesses (*Società di Peñarroya*, *Cahen d'Anvers et Cie* and *Mirabaud, Puerari et Cie*),⁸³ led CNG, in 1902, to a debt exposure for 3.8 million lira while the budget was further burdened with credits for 5 million granted to the SGI. A recovery plan was necessary and it was elaborated in Geneva (9 July 1902) by the delegates both of CNG and *Franco-Suisse*, resulting in the creation of a new Geneva-based holding company: the *Société financière Italo-Suisse* (*Italo-Suisse*).⁸⁴ The *Italo-Suisse* capital (12.5 million francs) was almost completely formed via a stock swap: the *Italo-Suisse* shares were exchanged for the SGI and SME's shares belonging to CNG and for SME's shares belonging to *Franco-Suisse*. This was in view of the intended future merger between SGI and SME. This way *Italo-Suisse* almost wholly owned both SGI and SME, while CNG had taken over the control of *Italo-Suisse* (30,299 shares of

a total of 50,000 shares). The seven-member Board of *Italo-Suisse* was in fact completely put under CNG's control through its Directors (Dénis Pérouse, Edmond Aubert, Raymond Lavaurs and Gustave Ador) as shown in Figure 5 (1903), which depicts the dense interlocking directorships linking the whole of the firms involved in CNG's network. Gustave Ador was also appointed as *Italo-Suisse's* President and Maurizio Capuano as its General Director in Naples. The *Italo-Suisse* creation allowed to immediately issuing new loan capital for 12.5 million francs (equal to its initial capital).⁸⁵ This complex financial operation resulted in a more effective organisation model of the Naples energy business, as Figure 6 highlights (1903). The Swiss financial institutions were now definitely the key core of CNG's network and the pyramidal ownership structure – which had been introduced thanks to the acquisition of the SGI – was now reshaped with the separation of the electricity business from the gas one.⁸⁶ CNG – which kept the vertex position – managed to maintain the control of the new structure until 1914, by not opening *Italo-Suisse's* shareholding.

6. Separation between energy sources and inter-corporate shareholding strategy: the breaking of CNG leadership (1903–20)

The foundation of *Italo-Suisse* made the control of financial decisions move outside of CNG's Board, as shown from the Board's meeting reports which only refer to votes on financial proposals developed elsewhere and regarding only gas businesses. From now on, the link between gas and electricity businesses for CNG only survived in the yearly high dividend accruing from its controlling interest in *Italo-Suisse*.

Nonetheless, even though the financial situation had been recovered, the problem of the increasing competition became even more urgent in the following years. Both the public utilities Municipalisation Act, in 1903, and the special law for Naples' industrialisation in 1904, mounted a serious challenge to CNG monopoly,⁸⁷ while the increasing competition on electricity prices exerted by SNIE, made the system incomes to lower. These serious threats led CNG to reopen the negotiations with SNIE, via *Italo-Suisse*, in order to reach a cooperation agreement and take 'complete control of Naples electric lighting market'.⁸⁸ The negotiations lasted from 1903 to 1909, when – in cooperation with COMIT – SNIE was acquired through a stock swap acquisition by the SGI. The acquiring company increased its capital in order to replace SNIE's retired shares.⁸⁹ This way, the system strengthened its hierarchical-type structure: *Italo-Suisse* maintained the control on SGI and, through this last step, it took over SNIE control, thus seizing this last isolate node within the network (compare Figures 6 and 7).

From that moment onward, both the financial and political role of the Swiss finance within CNG strengthened. It financed the expansion of gas plants on which CNG definitely focused its business, by consolidating in 1909 CNG's short-term debts (more than 2 million lira in October 1906).⁹⁰ On the other hand, the effective political action of Gustave Ador avoided, in 1913, the threat of municipalisation of gas supply. In 1913, deriving from the projects that the Naples municipality had undertaken in the wake of what other Italian municipalities – such as Bologna, Leghorn, Mantua, Padua, Reggio Emilia, Vicenza, Rome, Turin, Milan – were progressively realising, he established municipal companies to provide gas, electricity and other essential public services.⁹¹

In the meantime, in September 1913, *Italo-Suisse* started a recovery plan for the electric companies, which was illustrated within the Board of Directors of CNG, which still was the *Italo-Suisse's* majority shareholder. The plan – which finally involved SME – provided for a

new stock swap to be realised through new SME's shares to be issued and exchanged with the SGI's shares belonging to *Italo-Suisse*; part of this new SME's issue was intended to pay *Italo-Suisse* credit granted to SME. Hence, the pyramidal ownership structure was reshaped: SME had taken over the control of SGI which, in its turn, had acquired the control of SNIE. So the two local distribution firms (SGI and SNIE) were now controlled by the higher rank production firm (SME) which still remained under the control of *Italo-Suisse* notwithstanding its wide network of linked companies (Figure 7). SME's capital increase was realised in 1914 and it provided for widening the company's activities both on provincial and regional scales through forming new alliances. Really, CNG neither took a stake in SME's capital increase nor in *Italo-Suisse's* twin operation (1914).⁹² Particularly, *Italo-Suisse's* capital increase (30,000 shares) was subscribed for two-thirds by *Motor*⁹³ and for one-third by *Franco-Suisse*, thus entailing a dilution of CNG's ownership percentage.

This choice, aimed at concentrating its efforts on the Naples area for the construction of the new gas plants, had no positive results. At that moment, the outbreak of World War I determined a sharp price increase both of coal and freights with irreversible losses for CNG which was tottering on the brink of default. This situation made it difficult for CNG to raise new finance. Further loans on the Geneva place were indeed granted at increasing costs. Long term loans were guaranteed both by the deposit of *Italo-Suisse's* shares owned by the company and the pre-emption right on CNG's next share issues. This way, CNG had to give up its persisting and basic choice to reserve new share issues to its own shareholders.⁹⁴ A strategy had to be devised also for short-term loans which were financed by three important nodes of the network: *Banque de dépôts et crédit*,⁹⁵ *Banque fédérale* and *Comptoir d'escompte de Genève* (where René Hentsch, son of Ernest, was one of the Directors) financed the short-term debts of CNG (Figure 7). As a consequence, between 1915 and 1919, the Swiss component definitely prevailed within CNG's Board of Directors (Table 3 – the Swiss component increased to five members out of a total of nine).⁹⁶

Notwithstanding, CNG's financial conditions together with losses forecasts did not make it possible to pay out dividends as from 1915. One year later, new losses for 5 million lira entailed CNG suspending its bond amortisation⁹⁷ and increase its debt exposure on the Italian financial market (COMIT and *Banco di Napoli*). The only impelling financial commitments relative to the cash bonds 6% were honoured. In 1918, due to this catastrophic situation (further worsened by the Italian lira's sharp devaluation) *Banque fédérale* did not renew its credit lines to CNG which rapidly headed towards both insolvency and a serious risk of entering a liquidation process.⁹⁸

In 1919, in the aftermath of World War I, the solution arranged in Geneva for CNG's bail-out fatally led it from the top to the bottom of the pyramidal ownership structure with a definite loss of autonomy (Figure 8). A new stock swap was indeed decided which led SME to become CNG's controlling shareholder: new SME shares (to be issued by 1924) had to be exchanged with 36,300 (out of a total of 46,000 shares) CNG's shares⁹⁹ held both by French (3,000 shares) and Swiss shareholders (33,300 shares). The structural reorganisation granted SME's Directors 'plus des ¾ du capital social ce qui nous [SME] permettra de faire prendre à l'Assemblée toutes les décisions que nous [SME] jugerons utiles.'¹⁰⁰ This financial agreement was kept hidden. It was decided to call a CNG extraordinary general meeting on 31 January 1920, aimed at giving a brief and elusive information to the minority shareholders about the outright resignations of the Board of Directors due to the acquisition of CNG's majority stake by a 'gruppo italiano innominato'¹⁰¹ (undefined Italian group).¹⁰² It was also decided

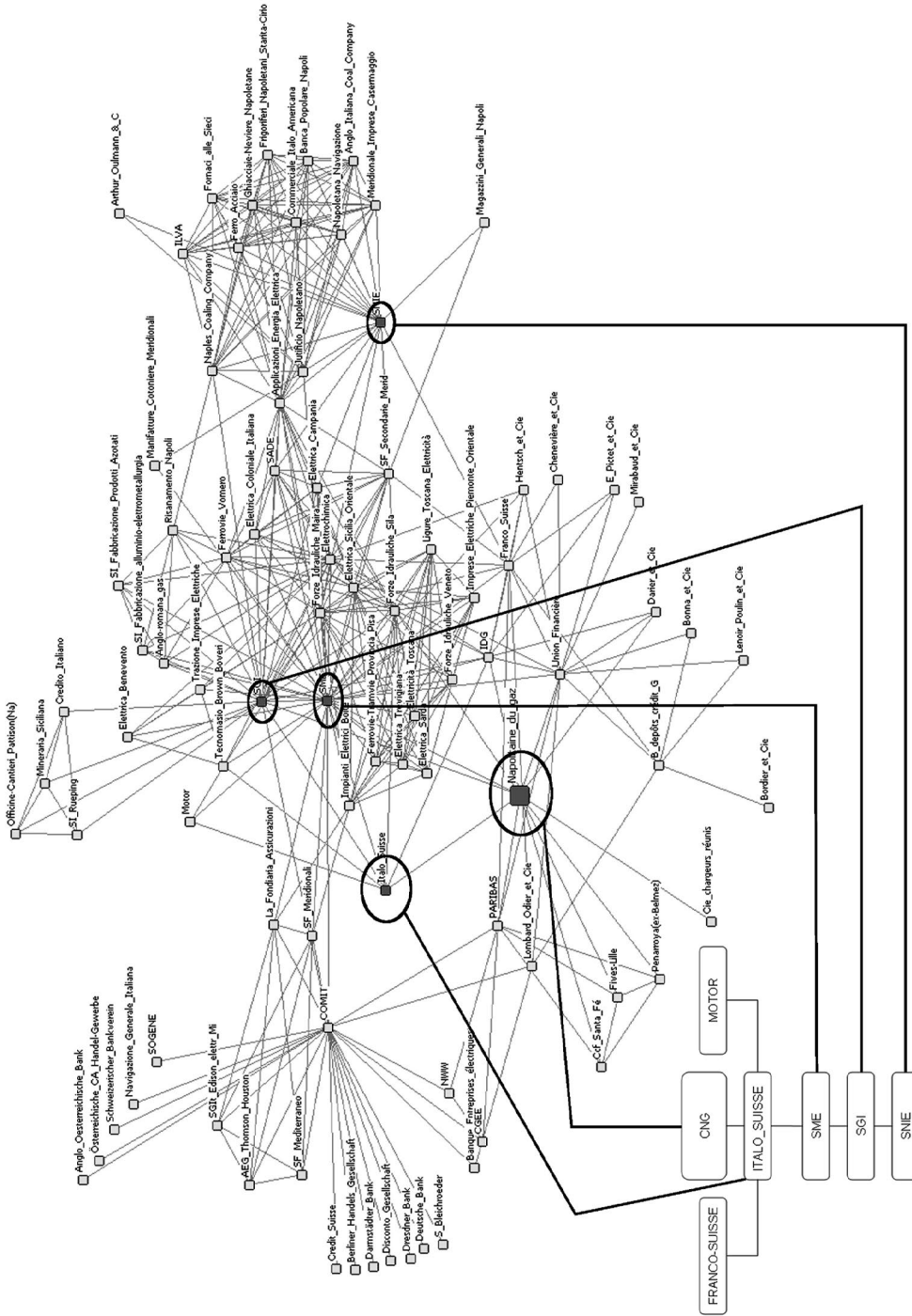


Figure 7. – CNG’s firm/firm network – 1914. Source: Database IFESMEZ. Note: 1 mode network - visualisation of sets of relations connecting firms and firms via interlocks with shared actors (firm/firm matrix). All the nodes represent firms. Dark grey nodes: firms included in the hierarchical scheme on the left side (largest node: hierarchy vertex).

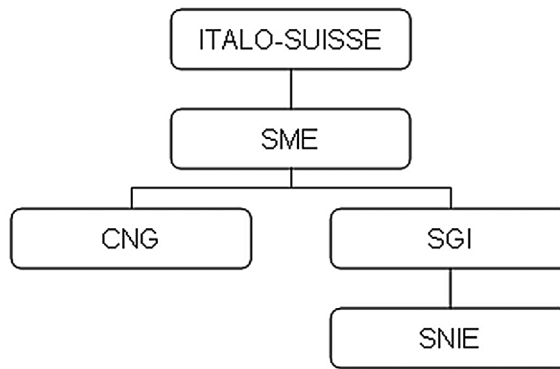


Figure 8. CNG/SME pyramidal ownership structure – 1919.

that the new CNG's Board would have been reshaped with 'éléments sûrs [...] qui n'ébruitent pas la part que la Meridionale [SME] prend dans l'affaire';¹⁰³ it would have been formed by nine members among whom the Swiss bankers Bouvier, Mirabaud e Bordier and six Italian members to be completely chosen by Maurizio Capuano¹⁰⁴ (Table 3). Therefore, since 1920, CNG's governance moved to SME even if the stock swap was realised in 1924 after SME's capital increase. This entailed that CNG's French group was completely excluded from the Naples energy business. This way SME had become the top of local hierarchical firm structure, enhancing its financial function, as testified by its budgets – from 1915 to 1921 – where the value of its financial portfolio strongly exceeded the value of its fixed assets.¹⁰⁵

Therefore, after a long series of financial operations, interconnections between firms had deeply changed its nature, becoming stronger than before, when they were essentially based on 'relations personnelles'¹⁰⁶ between their directors. The stock swap strategy implemented by the cooperative system of the Genevan high finance/*banque d'affaire* was a progressive rationalisation of the business forms addressed to cutting competition in the local energy sector, through merging the operating companies which became part of a structured group, which the clusters of actors continued to be part of. The pyramidal structure of ownership was realised by aggregating partners in the lower-standing firms and by co-opting competitor groups onto the firm system. This strategy allowed Swiss finance to expand the firm system always maintaining the same decision-making power by controlling the company at the helm of the cascade from one time to the next. A scheme of nested firms similar to 'Russian Dolls' well depicts the architecture of the system which the Swiss finance had managed to realise achieving the monopolistic control of the Naples energy market at the beginning of the twentieth century.

7. Conclusion

The article explores the issue of long-lasting relationships between a peripheral market, such as Italy and particularly the Mezzogiorno, and the core countries which foreign capital came from, through the complex business of CNG, which lies on the technological and financial crossroads between gas and electricity in Naples.

The magnifying glass of the analysed case study emphasises the key role that local and international strategic actors played in fostering the dynamics of integration of this

peripheral area into the 'space of flows' of the developing global capitalism, during the last decades of the 'long nineteenth century'. The relational abilities of local elites – as vehicles through which international capital flows found their way to and rooted in Southern Italy – matched the crucial financial and technological expertise of foreign investors in seizing the local energy market control. Encouraged by municipal-authority-granted monopoly through concession contracts, a persisting monopolistic control over Naples' lighting provision took shape, even during a period when other Italian municipalities headed towards urban-public-utilities municipalisation. This point highlights, even though not specifically touched upon in the article, problems of agency in behalf of the financial system organised around foreign investors in a weak institutional environment where monopoly rents could be extracted.

The use of joint methodologies (historical/SNA) proved to be effective in providing evidence as to how the network worked and how it mattered for actors to continue to raise finance for the complex Neapolitan public-utility-projects and to keep unchanged their monopolistic advantage during the time. The explanatory power of the network graphs has enhanced evidence from archival sources, allowing an overall view of the actors' long-term relationships as vehicles of long-term relationships between firms. Particularly, the financial know-how of the foreign investors, their cross relationships, their elasticity in adjusting the financial tools according to the changing dynamics of local and international monetary and financial markets has been proved crucial for the network structure to shift, during the time, from weak to strong corporate ties by means of the progressive structuring of a system reminiscent of Chinese boxes, nonetheless having a constant underlying base of social interpersonal ties.

Notes

1. Cassis, *Capitals of Capital*.
2. Cameron, *France and the Economic Development*; Gille, "Banking and Industrialisation"; Cassis, *Big Business*; Teichova, Kurgan and Ziegler, *Banking, Trade and Industry*; Jones, *Merchant to Multinationals*; Cassis, *Capitals of Capital*; Roth and Dinohobl, *Across the Borders*.
3. Williamson, *The economic*; Granovetter, "Economic Action," "Problems of Explanation" and "The Impact"; White, *Markets from Networks*.
4. Specific references: Nitti, *Il capitale straniero*; Gille, "Les investissements"; Dumoulin, *Les relations*; Hertner, *Il capitale tedesco*; De Cecco, *L'Italia e il sistema finanziario*. Some general overviews on Italian economic development in: Zamagni, "The Economic History"; Castronovo, *Storia Economica d'Italia*; Toniolo, *The Oxford Handbook*; Colli, "Foreign Enterprises and "Nurturing local."
5. Tarr and Dupuy, *Technology*; Giuntini, Hertner and Nunez, *Urban Growth*; Lenger, *European Cities*.
6. Castronovo, Paletta, Giannetti and Bottiglieri, *Dalla luce all'energia*; Bigatti, Giuntini, Mantegazza and Rotondi, *L'acqua e il gas in Italia*; Giuntini, "La città che cambia"; Dogliani and Gaspari, *L'Europa dei comuni*.
7. Schisani, "Finanze ed economia" and "How to Make."
8. Censimento generale della popolazione del Regno d'Italia (al 31 dicembre 1861), Ministero di Industria e Commercio, Direzione di Statistica, Stamperia Reale, 1863, 74.
9. Cameron, *France and the Economic Development*, 134.
10. Collezione delle leggi e de' decreti reali del Regno delle Due Sicilie (Laws and Decrees of the Kingdom of the Two Sicilies), Decree n. 676, 25 February 1860; Decree n. 809, 28 April 1860, Stamperia Reale, Naples 1860; Collezione delle leggi e decreti emanati nelle Provincie Continentali dell'Italia meridionale (Laws and Decrees for the Southern Italy Provinces), Decree n. 14, 1 July 1860; Decree n. 24, 6 July 1860; Decree n. 129, 24 August 1860, Stamperia Reale, Naples 1860.

11. This topic, not very frequent in literature, is discussed in Paquier and Williot, *L'industrie du gaz en Europe*.
12. Hughes, *Networks of Power*; Tarr and Dupuy, *Technology*; Van Der Vleuten and Kaijser, "Networking Europe," 21–48; Barjot, *La grande entreprise*; Bocquet, "Les réseaux d'infrastructures," 6–16; Bijker, Hughes and Pinch, *The Social Construction*.
13. Jones and Schröter, *The Rise*; Wilkins and Schröter, *The Free-standing Company*; Chandler, Amatori and Hikino, *Big Business*; Bonin, Bouneau, Caiullet, Fernandez and Marzagalli, *Transnational Companies*; Jones, *Multinationals*; Smith, *The Emergence*; Jones and Zeitlin, *The Oxford Handbook*; Khanna and Yafeh, "Business Groups"; Schröter, *The European Enterprise*; Colpan, Hikino and Lincoln, *The Oxford Handbook*.
14. Cameron, *France and the Economic Development*; Gille, "Banking and Industrialisation"; Cassis, *Big Business*; Barron Baskin and Miranti, *Storia della finanza d'impresa*; Jones, *Merchant to Multinationals*; Bonin, *Histoire de la Société générale*; Stoskopf, *Banquiers et financiers parisiens*; Flandreau, Holtfrerich and James, *International Financial History*; Hausmann, Hertner and Wilkins, *Global Electrification*; Stoskopf, *150 ans du CIC*.
15. Mintz and Schwartz, "Interlocking Directorates," 851–869 and *The Power Structure*; Stockman, Ziegler and Scott, *Networks of Corporate Power*; Mizruchi and Schwartz, *Intercorporate Relations*; Mizruchi, "What Do Interlocks Do?," 271–298; Windolf, *Corporate Networks*; David and Westerhuis, "The Power."
16. Hall and Soskice, *Varieties of Capitalism*.
17. Giannetti and Vasta, "Evolution"; Amatori and Colli, "European Corporations"; Colli and Vasta, *Forms of Enterprise*; Amatori, *Entrepreneurial Typologies*; Colli, *Corporate governance*.
18. Chiesi, "Property, Capital and Network"; Vasta and Baccini, "Banks and Industry in Italy," 139–159; Bianco and Pagnoni, "Interlocking Directorates," 203–227; Rinaldi and Vasta, "The Structure," 173–198; Bargigli and Vasta, "Ownership and Control," 111–152; Rinaldi and Vasta, "The Italian Corporate Network," 378–413; Drago, Ricciuti, Rinaldi and Vasta, "A Counterfactual Analysis"; Colli, Rinaldi and Vasta, *The Only Way to Grow?*
19. Mori, *Storia dell'industria elettrica*; Bruno, *Risorse per lo sviluppo*.
20. Economic actors: qualitative data – individual actors (public loans contractors, subcontractors, notaries, etc.; enterprises promoters, founders, shareholders, borrowers, directors, chairmen – indications supplied with short biographies where available); collective actors (firm constitution, duration, legal office, administrative head office, if any, etc.); quantitative data (public bonds nominal value, underwriting price, interest, current yield, etc.; capital stocks, shares (number and nominal value), bonds (number and nominal value), balance-sheets (in reclassified form and with links to analytical pages), stock exchange data, weekly quotations on different national and international stock exchanges). Political/social actors: composition of political and administrative bodies of the State (Monarchy; Governments; significant ministerial bodies; Parliament – legislatures of Chamber of Deputies and Senate; peripheral bodies – legislatures of city councils and municipalities; control bodies – ordinary and special Courts, such as Court of Auditors, State Council, etc.); composition of economic and financial institutions (boards of directors, ownership/co-ownership, management, etc.); composition of institutions with social and economic importance (Chamber of Commerce, clubs, parties, etc.); composition of family groups (kinship ties). Events/actions/activities: historical events significant to research aims: institutional changes, laws, decrees, wars, revolutions, diplomatic relations, historical events related to actors.
21. It has been created according to the model studied by the authors and is hosted on the web server of the University of Naples "Federico II" - www.ifesmez.unina.it.
22. The project is entitled Networks of powers, networks of capital and economic growth: querying the history of Southern Italy from a global perspective. 1850-1914 and it has been funded by the Compagnia San Paolo di Torino and the University of Naples "Federico II", within the scope of FARO 2011 (Finanziamento per l'Avvio di Ricerche Originali).
23. 20 January 2015.
24. Carroll and Sapinski, "Corporate Elites."
25. Sonquist and Koenig, "Interlocking Directorates," 196–230; Soreff and Zeitlin, "Finance Capital," 56–84; Carroll, *Corporate Power*.

26. Scott, *Networks of Corporate Power*, 184.
27. Each record includes the following fields:
 actor-to-firm relation: firm name, legal type of firm, firm purpose, name of actor bound to firm, actor's role, headquarters/offices where actor performs his role, date of role;
 firm-to-firm relation: firm name, legal type of firm, firm purpose, name of firm bound to firm, type of link, date of link.
28. Hollstein, "Qualitative Approaches."
29. Cross, Parker and Borgatti, "Making Invisible Work Visible"; Borgatti, Mehra, Brass and Labianca, "Network Analysis," 892–895; Scott and Carrington, *The SAGE Handbook*; Federico, Pfeffrey, Aigner, Mikschand and Zenk, "Visual Analysis," 179–183.
30. The original dataset – also including records not directly matching the research focus (and thus not loaded in UciNet) – consisted of 1073 records. 1862: 278 records (44 firms and 94 actors). 1874: 244 records (46 firms and 101 actors). 1903: 224 records (49 firms and 110 actors). 1914: 327 records (90 firms and 88 actors).
31. Borgatti, Everett and Freeman, *Ucinet for Windows*.
32. Caiazzo, "Reti di capitali."
33. Hausman, Hertner and Wilkins, *Global Electrification*, 12–13.
34. Compagnie Napolitaine d'éclairage et de chauffage par le gaz, Statuts, Imprimerie Centrale des Chemins de Fer de Napoléon Chaix et C.ie, Paris 1863, art. 3. (Archivio Centrale dello Stato di Roma (ACS), Ministero Agricoltura, Industria e Commercio (MAIC), box 235).
35. Jacquemyin, *Langrand-Dumonceau*; Dumoulin, *Les relations*.
36. Williot, *Naissance d'un service*.
37. Bezançon, "Histoire du droit"; Wollmann and Marcou, *The Provision*; Debande, "Le rôle"; Hautcœur and Romey, "Les émetteurs".
38. The concession contract for gas lighting, granted to the P&S in 1862 by the Naples municipality, ensured a monopoly on the energy sector to CNG. This was thanks to two specific clauses: (1) the exclusive right of laying underground pipes; and (2) the pre-emption right on an eventual change towards a different lighting system in consequence of technological innovation.
39. The crucial role of French financial actors was related to the intensifying of the process of concentration within gas industry which occurred during the 1850s, this process led to the formation of big companies which brought the whole of the cities under their control, Paris (1855), Marseille (1855), Lyon, etc. (Williot, *Naissance d'un service*). These actors carried ownership and control across borders and, in 1852, the Bologna gas supply was under the control of two French bankers, Charles Laffitte and Edward Blount and 10 years after, Naples was under the control of French/Swiss capitalists.
40. Savarese, *Dell'illuminazione della città*, 11.
41. Parent Schaken et Cie was the firm name of a series of general partnerships registered in Paris starting from 1850 and formed through successive renewals, changes or re-foundations by the two principal partners Basile Parent and Pierre Schaken (Archives de Paris (AP), AP/D31U3/163). The liquidation phase of the last Parent Schaken et Cie started in 1866 when Parent died. Information about the activities of this firm and its links with other Italian and foreign companies are scattered in a large bibliography (above all see Gille, *Les investissements*; Dumoulin, *Les relations*; Cameron, *France and the Economic Development*; Crouzet, *Fives-Lille*, 299–334; Bonin, *Histoire de la Société*; Stoskopf, *150 ans du CIC*).
42. Vincent Dubochet, native of the Swiss Canton of Vaud, had been a pioneer in French gas industry: in 1837, he had been the founder of one of the six Paris gas companies, later merged into the Parisienne du gaz (1855) (Williot, *Naissance d'un service*), closely bound to the Pereires's Crédit Mobilier. Auguste Dassier, native of Geneva, was one of the bankers of that particular branch of the Geneva Protestant haute banque that had turned from fabrique to banque. Particularly active in supporting industrial investments, partner of the Rothschilds' Réunion financière (1856), he was member of the Board of Directors of the Parisienne du gaz and was the President of the PLM, of which Basile Parent and Pierre Schaken were members as well (Paquier, *Daniel Colladon*).
43. Khanna and Yafeh, "Business Groups."

44. Together with the same Belgian group and the Italian bankers Vincenzo Bolmida (Turin) and Oscar Meuricoffre (Naples), in 1862 (1 September 1862), the P&S promoted the Turin-based banking company Società Generale Immobiliare per lavori di utilità pubblica e agricola (SOGENE) aimed at property lending. The Italian Government did not authorise the foreign head office. (ACS, MAIC, Direzione Generale Credito e Previdenza, Industrie, banche e società, f. 227).
45. Basile Parent was both founder and director of PLM and CIC.
46. This had allowed Parent to gain a position in the Tyrrhenian longitudinal railway project (suitable for the French 'Mediterranean System') aimed at including the Naples railway strategic network [Collezione delle leggi e de' decreti reali del Regno delle Due Sicilie, Decree n. 809, 28 aprile 1860. The contractors were: Gustave Delahante, Raffaele De Ferrari Duca di Galliera, José de Slamanca, Paulin Talabot, Antoine Chatelus, Edward Blount, Basile Parent, Thomas Brassey e William Buddicom (Archivio Notarile di Napoli (Naples Notary Archive), Notary Pascarella, year 1860, v. 2, 889, 24 August 1860, n. rep. 649)].
47. The partners of the Parent, Schaken et C.ie (1859) were: Parent Basile (Belgian constructor); Schaken Pierre (Belgian Constructor); Blin Eugène (French landowner) – who was Parent's brother-in-law and Schaken's son-in-law; Lavaurs François Louis (French constructor); Borguet Henri (Belgian constructor) since the 40s Parent and Schaken's business partner. (Centre historique des Archives nationales (CARAN), Paris, Minutier Central, Étude XLII, f. 1111).
48. The central actor is Basile Parent who has kinship ties with all the other nodes. Parent is indeed the key actor for the P&S' businesses and for the entire actor by actor network as the betweenness and degree centrality measures confirm.
49. According to the articles of CNG's Statutes, only four (as a maximum number) local members (Neapolitan committee) could be part of the Board of Directors out of a maximum total of twelve members and the valid decisions were taken with only 5 positive votes. The day to day management in the host country was carried out by a general manager who was responsible for implementing the Board's decisions, ensuring the circulation of information between the head office and the Neapolitan committee.
50. He had been the diplomatic link for the P&S to join the business of Southern Italy railways, in 1860.
51. Besides being one of the SOGENE's founders he had important international links, among which Cahen d'Anvers.
52. On this occasion, CNG's capital was increased (1,000 shares reserved to the existing shareholders) and new bonds – subsequent to the first issue in 1863 – were issued. In 1866 the stock capital amounted to 3 million francs and the debt capital to 3,465 million francs.
53. The Parent Schaken et Cie normally functioned as CNG's treasury (i.e. dividend distribution, coupon payment and short-term loans).
54. Atti del Consiglio Comunale di Napoli, 1867, Relazione sul contratto del 12 maggio 1862 per la illuminazione a gas. The specific defendant was the General Manager Emile Hémary, bound to the P&S by kinship ties (see Figure 3), whose speculative attitude had been already blamed by some shareholders of the Dassier group who were persuaded that he was "trop de l'école de Parent et Schaken" and that even if Basile Parent was aware of Hémary's unfairness "comme tous les grands spéculateurs n'est pas fâché d'avoir un homme qu'il considère comme à lui et qu'il peut charger de beaucoup de millions" (BGE, Geneva, Colladon's private correspondence, Letter of Colladon to Raoul-Duval, 21 June 1863).
55. Those businesses were also bound to the international banking houses Mirabaud, Paccard et Cie and Cahen d'Anvers through credit ties (López Morell, *La Casa Rothschild*).
56. Basile Parent was one of the most important shareholders, with a subscription of 7,760 shares (Gille, *La fondation*, 52; Bonin, *Histoire de la Société*).
57. Set up in 1863 for funding the Roman railways it appears as an isolate node within Figure 4, right side (ACS, MAIC, box 310).
58. The Società per le Strade Ferrate Meridionali, already bound to CNG since 1862 (Figure 1), had been closely related to the P&S which had become, at the same time, its building contractor, bondholder and its legal agent at the Paris stock exchange (1864–70). This last function as a representative at the Paris stock-exchange, in 1870, went to the Banque de Paris during the

- P&S winding-up process (Centre des archives économiques et financiers (CAEF), Direction du mouvement général de fonds, FB0031233/2).
59. CNG Archive, Board meetings reports, 21 September 1868, 25 July, 10 October and 16 December 1871.
 60. IDG was a holding company created in 1861 by the Swiss haute banque for the international gas businesses and it was already operating on the Italian gas market in Lodi, Ravenna and Bologna (Paquier, "Les Ador"). IDG shareholding in CNG can be traced in: BGE de Genève, Rapport, assemblée générale de la Compagnie de l'industrie du gaz, Genève, years 1865–93 (1865, 500 shares out of a total of 6,000, 500 francs each; 1867, 715 shares out of a total of 6,000 shares, of 500 francs each; 1893, 2,944 shares out of a total of 24,000 shares of 250 lire).
 61. Fernand Raoul-Duvall was Dassier's son-in-law. August Dassier was brother-in-law of Jean Ador who had married the Dassier's sister Andrienne. One of their daughters (Stephanie Ador) married Jean Daniel Colladon and one of their sons (Louis) was the father of Gustave Ador (cfr. infra). (Perroux, « Tradition, » 171–173; Stoskopf, *Banquiers et financiers*; Paquier, *Daniel Colladon*).
 62. It was decided to double CNG's capital up to 6 million lire by issuing 24,000 shares of 250 lire each. 12,000 shares (out of the total of 24,000) were issued to replace 6,000 early shares of 500 francs each (CNG Archive, Reports of general meetings, 22 September 1885).
 63. Giannetti, *Tecnologia ed economia*.
 64. Paquier and Williot, "Stratégies entrepreneuriales."
 65. Indeed, IDG, had very early begun to invest in electricity sector since the 1880s. It was among the co-owners of Edison Suisse and the Italian Società piemontese di elettricità (BGE de Genève, Rapport, assemblée générale de la Compagnie de l'industrie du gaz, Genève, various years).
 66. Cassis, *Capitals of Capital*, 83–85 and 142–146.
 67. Hertner, *Il capitale tedesco*.
 68. CNG Archive, Board meetings reports, 10 September 1890. The Naples municipal administration had shown some interest in entering the electricity sector from the mid-1880s, but this interest was strongly hampered by CNG (Bruno, "Capitale straniero"; de Majo, "Manifattura e fabbrica").
 69. CNG Archive, Board's meetings reports, 24 May 1894. SGI was a Rome-based company which, since 1888, had entered Neapolitan market, by incorporating the pre-existing Società anonima cooperativa napoletana. By acquiring the SGI's majority stake from the Banca industriale e commerciale di Roma (the most important shareholder of the SGI itself). (Archivio Storico dell'Enel Napoli (ASEN), SGI, Reports of general meetings, 10 December 1888).
 70. A credit opening by Bonna et Cie, which was CNG's agent in Geneva since its foundation and member of the Union Financière; loans made by IDG; new bonds issue in 1893; a credit opening by the Banque Genevoise de Prêts et Dépôts (BGDP), which was in turn a direct expression of Geneva private bankers and cooperated with Union Financière.
 71. Gustave Ador was also President of the Swiss State Council, at the time (Paquier, "Les Ador").
 72. Paquier, « Les Ador, » 163–164. This was "en raison des intérêts importants de la Place de Genève dans [les] affaires et du concours qu'elle [...] a constamment donné, particulièrement lors des derniers accroissements [du] capital social" (CNG Archive, Reports of general meetings, 28 September 1892).
 73. CNG Archive, Board meetings reports 26 September 1894. The contract preserved the pre-emption right of CNG on new contracts.
 74. CNG Archive, Board meetings reports, 25 April 1894; Segreto, "Imprenditori e finanzieri."
 75. CNG Archive, Board meetings reports, 29 April 1896.
 76. Ernest Hentsch (1853–1921), son of Charles Hentsch, had become partner of the maison Hentsch et C^{ie} in 1878 and succeeded his father since 1902.
 77. CNG Archive, Reports of general meetings, 23 September 1896. The presence of Hentsch met the "désirs très légitimes de nos actionnaires de Genève de voir augmenter dans le Conseil la représentation de leurs intérêts " in the belief that "Hentsch par sa connaissance approfondie des affaires financières et industrielles et par la situation qu'occupe sa Maison sur la place de Genève, nous apportera le concours le plus précieux" (Centre des Archives du Monde du Travail [CAMT] Roubaix, CNG's general meetings reports, 23 September 1896).
 78. CNG Archive, Board meetings reports, 29 May 1895, 27 November 1895, 28 April 1897, 9 March 1898.

79. The negotiations led by Lavaurs with a French financial group in Paris had no positive result (CNG Archive, Board meetings reports, from 29 March to 26 April 1899).
80. CNG Archive, Board meetings reports, from August 1898 to March 1899. SME had taken over a concession for exploiting of the water power of the Tusciano river (Salerno).
81. SNIE was founded in 1899 thanks to investors from Turin and Naples.
82. CNG Archive, Board meetings reports, 29 May 1901 and 26 June 1901.
83. López-Morell, *La Casa Rothschild*, 283–285 and 300–301.
84. Paquier, “Swiss Holding Companies.”
85. CNG Archive, Board meetings reports, 30 July 1902, 29 October 1902. Italo-Suisse was founded on 29 September 1902.
86. This complex financial operation led CNG to strongly lower its debt exposure (from 4.8 million to about 836,000 lira) in 1903, so making it possible for CNG to comply with the requirements deriving from a new contract which had been negotiated with the Naples municipality on 5 April 1900. The new concession provided for widening electric lighting to the whole city of Naples and entailed that CNG should expand its plants to meet demand for new calorific use of the gas (CNG Archive, Board meetings reports, 22 June 1903). The validity of this contract, which had involved both CNG and SGI, was questioned, in 1900, by the parliamentary inquiry led by the senator Saredo which investigated malpractice in the Naples municipal administration. As a consequence, Krafft e Pérouse were questioned for monopolistic behaviour and bribery, and Krafft went away from its post as CNG’s General Manager and entered the Fives Lille and was appointed as General Manager (CAMT, 65 AQ G 187).
87. Indeed, the public utilities Municipalisation Act enabled municipalities to manage public services through directly emanated companies while the special law for Naples’ industrialisation in 1904 entrusted the municipality of the exploitation of the hydraulic power of the Volturno river (Berselli, Della Peruta and Varni, *La municipalizzazione*).
88. Confalonieri, “Banca e industria in Italia,” 216.
89. Confalonieri, “Banca e industria nella,” 337–339.
90. CNG Archive, Board meetings reports of different dates between 1906 and 1909.
91. In 1914, there were 170 municipalised companies to provide public services, among which, 31 gas companies (10 of which foreign companies Acqui [Alessandria], Bologna, Leghorn, Mantua, Marsala, Padua, Pisa, Reggio Emilia, Udine and Vicenza) and about 50 electricity companies. (Hertner, « Municipalizzazione e capitale »).
92. Since SME’s foundation, CNG took part to its capital having «pour but principal de protéger son exploitation d’électricité à Naples contre les concurrences dont pourrait la menacer l’utilisation, en dehors d’elle, des forces du Tusciano». CNG Archive, Board meetings reports, 30 May 1900.
93. Segreto, “Financing the Electric Industry.”
94. CNG Archive, Board meetings reports, 16 July 1915 and 29 September 1915; CAMT, Roubaix, Bulletin financier Suisse, 25 September 1915. The pre-emption right was transferred as an additional collateral for a new special loan in the form of 10-year cash bonds 6%, negotiated by Bouvier in 1915.
95. The Banque de dépôts et crédit was founded in 1902 through the transformation of the Banque Genevoise de Prêts et Dépôts, promoted by Franco-Suisse, Union Financière, Paribas and other financial partners of Franco-Suisse, in order to raise finance for the development of “certaines sociétés formées sous Vos [Franco-Suisse] auspices”. CAMT, Roubaix, Franco-Suisse General Meeting Reports, 18 October 1902.
96. Between 1915 and 1917, there were some changes in the Board’s composition. On 16 July 1915, Pierre Bordier entered to succeed to Arthur Pernolet (died in 1915) and, on 23 August 1915, Jean Mirabaud entered to succeed to De Siervo (died in 1913). Two years later, in 1917, Gustave Ador went away from the Board of Directors after having been appointed as a member of the Swiss Federal Council. Finally, in the same year, CNG’s General Director since 1905, the Swiss engineer Louis Chavannes entered the Board to succeed to René Raoul-Duval died during World War I (CNG Archive, Board meetings reports).
97. CNG Archive, Reports of general meetings, 12 October 1916.
98. CNG Archive, Reports of general meetings, 27 November 1918.

99. The terms and conditions for the exchange provided for 3 CNG's shares vs 2 SME's shares (ASEN, Copialettere Capuano, letters between 28 September 1918 and 12 December 1920).
100. ASEN, Copialettere Capuano, letter of 19 January 1920.
101. Ibid.
102. «Cette solution est certainement à préférer sous tous les rapports. Elle a le grand avantage de sanctionner par une réunion solennelle d'Assemblée les changements portés à l'affaire et le procès verbal relatif pourra si nécessaire être communiqué aux tiers. Je comprends que c'est un petit ennui pour les anciens Administrateurs de remplir encore cette formalité, mais j'y vois le seul moyen d'entrer officiellement et ouvertement dans la nouvelle vie de la Compagnie». (ASEN, Copialettere Capuano, letter of 23 December 1919).
103. ASEN, Copialettere Capuano, letter of 23 December 1919.
104. Six members not including the President, baron Pio Carbonelli. (ASEN, Copialettere Capuano, letter of 23 December 1919).
105. De Benedetti, *Il masso di Sisifo*, 38.
106. ASEN, SME, Segreteria Cenzato, I-3-2-d-Verbal e incarti del Comitato, Note no. 71 to SME's Committee, 9 December 1921. Still in 1924 the Swiss group maintained SME's control. Ivi, Procès verbal de la réunion des principaux intéressés de la Place de Genève à la Compagnie Napolitaine du gaz et à la Société Méridionale d'électricité, 9 January 1924.

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References

Archival sources

- CNG Private Archive, Naples: Board meetings reports; Reports of general meetings.
- ASEN (Enel Historical Archive), Naples: SGI, Reports of general meetings; SME Segreteria Cenzato I-3-2-d; SME Segreteria Cenzato, C19; Copialettere Capuano.
- ASN (Naples State Archive), Naples: Tribunale di Commercio and Tribunale Civile (1862–1919).
- ANN (Naples Notary Archive), Naples: Notaio Pascarella, year 1860, v. 2.
- ACS (State Central Archive), Rome: Ministero Agricoltura, Industria e Commercio (MAIC), Direzione Generale Credito e Previdenza, Industrie, banche e società, box 227, 235, 310; Enti Pubblici e Società (EPS), SOGENE, Board meetings reports.
- CAMT (Centre des Archives du Monde du Travail), Roubaix: 65 AQ G 187 CNG General meetings reports (missing volumes within CNG Archive sources); 65 AQ G 543 Franco-Suisse General Meeting Reports.
- AP (Archives de Paris), Paris: Greffe du tribunal de commerce, D32U3 (Registres d'enregistrement) and D31U3 (liasses d'actes de société).
- CARAN (Archives Nationales de France), Paris: Minutier Central, Étude XLII, f. 1056 and 1111.
- CAEF (Centre des Archives Économiques et Financiers), Savigny-le-Temple: Direction du mouvement général des fonds, FB0031233/2.
- BGE (Bibliothèque de Genève), Geneva: Jean Daniel Colladon private correspondence; Rapport, assemblée générale de la Compagnie de l'industrie du gaz (IDG).

Bibliography

- Amatori, F. "Entrepreneurial Typologies in the History of Industrial Italy: Reconsiderations." *Business History Review* 85, no. 2 (2011): 151–180.
- Amatori, F., and A. Colli. "European Corporations: Ownership, Governance, Strategies and Structures. A Review of Five Countries: United Kingdom, Germany, France, Italy and Spain." In Schröter H. (ed), *The European Enterprise: Historical Investigation into a Future Specie*, edited by H. Schröter, 23–36. Berlin: Springer Verlag, 2008.
- Bargigli, L., and M. Vasta. "Ownership and Control in Italian Capitalism." In *Evolution of Italian Enterprises in the 20th Century*, edited by R. Giannetti and M. Vasta, 111–152. Heidelberg: Physica-Verlag, 2006.
- Barjot, D. *La grande entreprise française de Travaux publics 1883–1974*. Paris: Economica, 2006.
- Barron Baskin, J., and P.J. Miranti Jr. *Storia della finanza d'impresa*. Laterza: Roma-Bari, 2000.
- Berselli, A., F. Della Peruta, and A. Varni, eds. *La municipalizzazione in area padana. Storia ed esperienze a confronto*. Milano: Franco Angeli, 1988.
- Bezançon, X. "Histoire du droit concessionnaire en France." *Entreprises et histoire* 38, no. 1 (2005): 24–54.
- Bianco, M., and E. Pagnoni. "Interlocking Directorates Across Listed Companies in Italy: The Case of Banks." *BNL Quarterly Review Special Issue* (1997): 203–227.
- Bigatti, G., A. Giuntini, A. Mantegazza, and C. Rotondi. *L'acqua e il gas in Italia. La storia dei servizi a rete, delle aziende pubbliche e della Federgasacqua*. Milano: Franco Angeli, 1997.
- Bijker, W. E., T. P. Hughes, and T. Pinch. *The Social Construction of Technological Systems*. Cambridge, MA: MIT Press, 2012.
- Bocquet, D. "Les réseaux d'infrastructures urbaines au miroir de l'histoire: acquis et perspectives." *Flux* 65, no. 3 (2006): 6–16.
- Bonin, H., C. Bouneau, L. Caiullet, A. Fernandez, and S. Marzagalli. *Transnational Companies. 19th–20th Centuries*. Paris: Plage, 2002.
- Bonin, H. *Histoire de la Société générale*. Droz: Genève, 2006.
- Borgatti, S. P., M. G. Everett, and L. C. Freeman. *Ucinet for Windows: Software for Social Network Analysis, Analytic Technologies*, 2002.
- Borgatti, S. P., A. Mehra, D. J. Brass, and G. Labianca. "Network Analysis in the Social Sciences." *Science* 323, no. 5916 (2009): 892–895.
- Bruno, G. "Capitale straniero e industria elettrica nell'Italia meridionale (1895–1935)." *Studi Storici* no. 4 (1987): 943–983.
- Bruno, G. *Risorse per lo sviluppo. L'industria elettrica meridionale dagli esordi alla nazionalizzazione*. Napoli: Liguori, 2004.
- Caiazzo, F. "Reti di capitali e reti di servizi: la Compagnie Napolitaine d'éclairage et de chauffage par le gaz (1862–1919)." PhD thesis tutor Schisani M.C., University of Naples "Federico II", Naples 2013;
- Cameron, R. E. *France and the Economic Development of Europe, 1800–1914*. Princeton, NJ: Princeton University Press, 1961.
- Carroll, W. K. *Corporate Power in a Globalizing World: A Study in Elite Social Organization*. Oxford: Oxford University Press, 2004.
- Carroll, W. K., and J. P. Sapinski. "Corporate Elites and Intercorporate Networks." In *The SAGE Handbook of Social Network Analysis*, edited by J. Scott and P. J. Carrington, 180–195. London: SAGE Publication, 2011.
- Cassis, Y. *Big Business*. New York: Oxford University Press, 1997.
- Cassis, Y. *Capitals of Capital*. Cambridge: Cambridge University Press, 2006.
- Castronovo, V., G. Paletta, R. Giannetti, and B. Bottiglieri eds. *Dalla luce all'energia. Storia dell'Italgas*. Laterza: Roma-Bari, 1987.
- Castronovo, V. *Storia economica d'Italia: dall'Ottocento ai giorni nostri*. Torino: Einaudi, 1995.
- Chandler, A. D., F. Amatori, and T. Hikino, eds. *Big Business and the Wealth of Nations*. Cambridge: Cambridge University Press, 1997.
- Chiesi, A. M., "Property, capital and network structure". In *Networks of corporate power*, edited by F. S. Stockman, R. Ziegler, and J. Scott. Cambridge: Polity Press, 199–214.
- Colli, A. *Corporate governance e assetti proprietari: genesi, dinamiche e comparazioni internazionali*. Marsilio: Venezia, 2006.

- Colli, A. "Foreign Enterprises (1913–72)." In *Forms of Enterprises in 20th Century Italy. Boundaries, Structures and Strategies*, edited by A. Colli and M. Vasta, 87–111. Cheltenham and Northampton: Elgar, 2010.
- Colli, A. "Nurturing Local Capabilities? Foreign Multinationals' Entry Strategies in the Italian Economic History." Paper presented at the World Business History Conference, Frankfurt am Main, 17 March 2014, <http://worldbhc.org/?seite=full%20program>
- Colli, A., and M. Vasta. *Forms of Enterprise in 20th Century Italy Boundaries, Structures and Strategies*. Cheltenham: Elgar, 2010.
- Colli, A., A. Rinaldi, and M. Vasta. *The Only Way to Grow? Italian Business Groups in Historical Perspective*. http://www.worldbhc.org/files/full%20program/A1_B1_Colli_11_091013.pdf
- Colpan, A. M., T. Hikino, and J. R. Lincoln, eds. *The Oxford Handbook of Business Groups*. New York: Oxford University Press, 2010.
- Confalonieri, A. *Banca e industria in Italia (1894–1906). III. L'esperienza della Banca Commerciale Italiana*. Bologna: il Mulino, 1980.
- Confalonieri, A. *Banca e industria nella crisi del 1907*. Milano: Comit, 1982.
- Cross, R., A. Parker, and S. Borgatti. "Making Invisible Work Visible: Social Network Analysis and Strategic Collaboration." *California Management Review* 44, no. 2 (2002): 25–47.
- Crouzet, F. « Fives-Lille: une entreprise de constructions mécaniques pendant la "Grande dépression" et après. » In *L'économie française du XVIIIe au XXe siècle*. 299–334. Paris: Presses Paris Sorbonne, 2000.
- David, T., and G. Westerhuis (eds.). *The Power of Corporate Networks: A Comparative and Historical Perspective*. New York: Routledge, 2014.
- De Benedetti, A. *Il masso di Sisifo. Studi sull'industrializzazione in bilico*. Roma: Carocci, 2006.
- De Cecco, M., ed. *L'Italia e il sistema finanziario internazionale 1861–1914, Collana Storica della Banca d'Italia, Documenti*. Roma-Bari: Laterza, 1990.
- de Majo, S. "Manifattura e fabbrica." In *Napoli, un destino industriale*, edited by A. Vitale, 25–93. Napoli: CUEN, 1992.
- Debande, O. « Le rôle du secteur privé dans le financement des infrastructures. Une mise en perspective historique. » *Revue économique* 48, no. 2 (1997): 197–229.
- Dogliani, P., and O. Gaspari. *L'Europa dei comuni: origini e sviluppo del movimento comunale europeo dalla fine dell'Ottocento al secondo dopoguerra*. Roma: Donzelli, 2003.
- Drago, C., R. Ricciuti, A. Rinaldi, and M. Vasta. "A Counterfactual Analysis of the Bank–Industry Relationship in Italy, 1913–1936." DEMB Working Papers.
- Dumoulin, M. *Les relations économique italo-belges (1861–1914)*. Bruxelles: Palais des Académies, 1990.
- Federico, P., J. Pfeffery, W. Aigner, S. Mikschand, and L. Zenk. "Visual Analysis of Dynamic Networks using Change Centrality." *Advances in Social Networks Analysis and Mining (ASONAM)*, 2012 IEEE/ACM International Conference on 26–29 August 2012, 179–183.
- Flandreau, M., C. L. Holtfrerich, and H. James. *International Financial History in the Twentieth Century*. New York: Cambridge University Press, 2002.
- Giannetti, R., and M. Vasta. *Evolution of Italian Enterprises in the 20th Century*. Heidelberg: Physica-Verlag, 2006.
- Giannetti, R. *Tecnologia ed economia del sistema elettrico, in Storia dell'industria elettrica italiana*, v. 1. Laterza: Roma-Bari, 1992, 365–379.
- Gille, B. "Banking and Industrialisation in Europe 1730–1914." In *Fontana Economic History of Europe*, v. 3, sect. 4, edited by C.M. Cipolla, 255–300. Londra: Collins, 1970.
- Gille, B. *Les investissements français en Italie (1815–1914)*. Torino: Ilte, 1968.
- Gille, B. "La fondation de la Société générale." *Histoire des Entreprises* 8 (1961): 5–64.
- Giuntini, A., ed. *La città che cambia. Infrastrutture urbane e servizi pubblici a rete in Italia tra '800 e '900*, Special issue of «Ricerche Storiche» XXX (2000): 3.
- Giuntini, A., P. Hertner, and G. Nunez, eds. *Urban Growth on Two Continents in the 19th and 20th Centuries. Technology, Networks: Finance and Public Regulation*. Granada: Editorial Comares, 2004.
- Granovetter, M. "Economic Action and Social Structure: The Problem of Embeddedness." *American Journal of Sociology* 91, no. 3 (1985): 481–510.
- Granovetter, M. "Problems of Explanation in Economic Sociology." In *Networks and Organizations: Structure, Form and Action*, edited by N. Nohria and R. Eccles, 25–26. Boston, MA: Harvard Business School, 1992.

- Granovetter, M. "The Impact of Social Structure on Economic Outcomes." *Journal of Economic Perspectives* 19 (2005): 33–50.
- Hall, P. A., and D. Soskice, eds. *Varieties of Capitalism. The Institutional Foundations of Comparative Advantage*. Oxford: Oxford University Press, 2001.
- Hausman, W. J., P. Hertner, and M. Wilkins, eds. *Global Electrification. Multinational Enterprise and International Finance in the History of Light and Power, 1878–2007*. New York, NY: Cambridge University Press, 2008.
- Hautcœur, P.-C., and C. Romey. « Les émetteurs sur le marché financier français 1800–1840. » PSE working paper 2006–41, 10–22.
- Hertner, P. *Il capitale tedesco in Italia dall'Unità alla prima guerra mondiale: banche miste e sviluppo economico italiano*. Bologna: Il Mulino, 1984.
- Hertner, P. "Municipalizzazione e capitale straniero nell'età giolittiana." In *La municipalizzazione in area padana. Storia ed esperienze a confronto*, edited by A. Berselli, F. Della Peruta, and A. Varni, 58–79. Milano: Franco Angeli, 1988.
- Hollstein, B. "Qualitative Approaches." In *The SAGE Handbook of Social Network Analysis*, edited by J. Scott and P. J. Carrington, 404–416. London: SAGE Publication, 2011.
- Hughes, T. P. *Networks of Power: Electrification in Western Society, 1880–1930*. Baltimore, MD: Johns Hopkins University Press, 1983.
- Jacquemyin, G. *Langrand-Dumonceau, promoteur d'une puissance financière catholique*. v. II. Bruxelles: Éditions Université libre de Bruxelles, Institut de Sociologie, 1960.
- Jones, G. *Merchant to Multinationals: British Trading Companies in the Nineteenth Centuries*. New York: Oxford University Press, 2000.
- Jones, G. *Multinationals and Global Capitalism: From the Nineteenth to the Twenty-first Century*. New York: Oxford University Press, 2005.
- Jones, G., and H. Schröter, eds. *The Rise of Multinationals in Continental Europe*. Aldershot: E. Elgar, 1993.
- Jones, J., and J. Zeitlin, eds. *The Oxford Handbook of Business History*. New York: Oxford University Press, 2007.
- Khanna, T., and Y. Yafeh. "Business Groups in Emerging Markets: Paragons or Parasites?" *Journal of Economic Literature* 45, no. 2 (2007): 331–372.
- Lenger, F. *European Cities in the Modern Era, 1850–1914*. Leiden: Brill, 2012.
- López Morell, M. Á., *La Casa Rothschild en España: (1812–1941)*. Madrid: Marcial Pons, 2005.
- Mintz, B., and M. Schwartz. "Interlocking Directorates and Interest Group Formation." *American Sociological Review* 46 (1981): 851–869.
- Mintz, B., and M. Schwartz. *The Power Structure of American Business*. Chicago, IL: University of Chicago Press, 1985.
- Mizruchi, M. S., and M. Schwartz eds. *Intercorporate Relations: The Structural Analysis of Business*. Cambridge: Cambridge University Press, 1987.
- Mizruchi, M. S. "What Do Interlocks Do? An Analysis, Critique, and Assessment of Research on Interlocking Directorates." *Annual Review of Sociology* 22 (1996): 271–298.
- Mori, G., ed. *Storia dell'industria elettrica in Italia*. vol. 1. Le origini. 1882–1914. Roma-Bari: Laterza, 1992.
- Nitti, F. S. *Il capitale straniero in Italia*. Bari: Laterza, 1915.
- Paquier, S., and J. P. Williot, « Stratégies entrepreneuriales et évolution des marchés des années 1840 aux années 1930. » In *L'industrie du gaz en Europe aux XIXe et XXe siècles*, edited by S. Paquier and J. P. Williot, 53–63. Bruxelles : PIE-Peter Lang, 2005.
- Paquier, S. *Daniel Colladon (1802-1893). Un ingénieur-conseil au coeur de l'industrialisation européenne: science, technique et milieu d'affaires*. (forthcoming).
- Paquier, S. *Les Ador et l'industrie gazière*. In *Gustave Ador, 58 ans d'engagement politique et humanitaire, Actes du Colloque Gustave Ador - Genève, 9,10 e 11 novembre 1995*, edited by R. Durand. Genève : Fondation Gustave Ador, 1996.
- Paquier, S. "Swiss Holding Companies From the Mid-nineteenth Century to the Early 1930s: The Forerunners and Subsequent Waves of Creations." *Financial History Review* 8, no. 2 (2001): 163–182.
- Paquier, S., and J. P. Williot (eds.). *L'industrie du gaz en Europe aux XIXe et XXe siècles*. PIE-Peter Lang: Bruxelles, 2005.

- Perroux, O. « Tradition, vocation et progrès: les élites bourgeoises de Genève (1814–1914). » PhD thesis, Université de Genève, 2003.
- Rinaldi, A., and M. Vasta. "The Italian Corporate Network After the 'Golden Age' (1972–1983): From Centrality to Marginalization of State-owned Enterprises." *Enterprise & Society* 13, no. 2 (2012): 378–413.
- Rinaldi, A., and M. Vasta. "The Structure of Italian Capitalism, 1952–1972: New Evidence Using the Interlocking Directorates Technique." *Financial History Review* 12, no. 2 (2005): 173–198.
- Roth, R., and G. Dinshoh, eds. *Across the Borders: Financing the World's Railways in the Nineteenth and Twentieth Centuries*. Aldershot: Ashgate Publishing, 2008.
- Savarese, R. *Dell'illuminazione della città di Napoli. Memoria al Consiglio Comunale di Napoli*. Napoli, 1861.
- Schisani, M. C. "Finanze ed economia nel regno di Napoli." In *Il pensiero e l'opera di Domenico Demarco*, edited by F. Balletta, 116–133. Milano: Franco Angeli, 2010.
- Schisani, M. C. "How to Make a Potentially Defaulting Country Credible: Karl Rothschild, the Neapolitan Debt and Financial Diplomacy (1821–26)." *Rivista di Storia Economica* no. 2 (2010): 233–278.
- Scott, J., and P. J. Carrington. *The SAGE Handbook of Social Network Analysis*. London: SAGE Publications, 2011.
- Scott, J. "Networks of Corporate Power: A Comparative Assessment." *Annual Review of Sociology* 17, no. 1 (1991): 181–203.
- Segreto, L. "Financing the Electric Industry Worldwide: Strategy and Structure of the Swiss Electric Holding Companies, 1895–1945." *Business and Economic History* 23, no. 1 (1994): 162–175.
- Segreto, L. "Imprenditori e finanzieri." In *Storia dell'industria elettrica in Italia*, v. 1, *Le origini 1882-1914*, edited by G. Mori, 249–337. Laterza: Roma-Bari, 1992.
- Smith, M. S. *The Emergence of Modern Business Enterprise in France, 1800–1930*. Cambridge: Harvard University Press, 2006.
- Sonquist, J. A., and T. Koenig. "Interlocking Directorates in the Top U.S. Corporations: A Graph Theory Approach." *The Insurgent Sociologist* 5, no. 3 (1975): 196–230.
- Soref, M., and M. Zeitlin. "Finance Capital and the Internal Structure of the Capitalist Class in the United States." In *Intercorporate Relations: The Structural Analysis of Business*, edited by M. S. Mizruchi and M. Schwartz, 56–84. Cambridge: Cambridge University Press, 1987.
- Stockman, F. N., R. Ziegler, and J. Scott. *Networks of Corporate Power*. Cambridge: Polity Press, 1985.
- Stoskopf, N. *150 ans du CIC, 1859–2009*, v. 1 and 2. Paris: Editions La Branche, 2009.
- Stoskopf, N. *Banquiers et financiers parisiens*. Paris: Picard/Cénomane, 2002.
- Tarr, J., and G. Dupuy, eds. *Technology and the Rise of the Networked City in Europe and America*. Philadelphia, PA: Temple University Press, 1988.
- Teichova, A., G. Kurgan, and D. Ziegler, eds. *Banking, Trade and Industry. Europe, America and Asia From the Thirteenth to the Twentieth Century*. Cambridge: Cambridge University Press, 1997.
- Toniolo, G. (ed.). *The Oxford Handbook of the Italian Economy since Unification*. New York, NY: Oxford University Press, 2013.
- Van Der Vleuten, E., and A. Kaijser. "Networking Europe." *History and Technology* 21, no. 1 (2005): 21–48.
- Vasta, M., and A. Baccini. "Banks and Industry in Italy: 1911–36. New Evidence Using the Interlocking Directorates Technique." *Financial History Review* 4 (1997): 139–159.
- White, H. C. *Markets from Networks: Socioeconomic Models of Production*. Princeton, NJ: Princeton University Press, 2002.
- Wilkins, M., and H. Schröter, eds. *The Free-Standing Company in the World Economy. 1830–1996*. New York, NY: Oxford University Press, 1998.
- Williamson, O. E. *The Economic Institution of Capitalism. Firms, Markets, Relational Contracting*. New York, NY: The Free Press, 1985.
- Williot, J. P. *Naissance d'un service public: le gaz à Paris*. Paris: Rive-Droit, 1999.
- Windolf, P. *Corporate Networks in Europe and the United States*. New York, NY: Oxford University Press, 2002.
- Wollmann, H., and G. Marcou, eds. *The Provision of Public Services in Europe. Between State, Local Government and Market*. Cheltenham: Edward Elgar, 2010.
- Zamagni, V. *The Economic History of Italy 1860–1990*. Oxford: Clarendon Press, 1993.