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978-0-521-88035-0 - Global Electrification: Multinational Enterprise and International Finance in the History of Light and Power, 1878-2007

William J. Hausman, Peter Hertner and Mira Wilkins

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## Global Electrification

Electricity is essential. This book examines how multinational enterprises and international finance influenced the course of electrification around the world. Multinational enterprises played a crucial role in the spread of electric light and power from the 1870s through the first three decades of the twentieth century. But their role did not persist, as over time they exited through “domestication” (buy-outs, confiscations, or other withdrawals), so that by 1978 multinational enterprises in this sector had all but disappeared, replaced by electric utility providers with national business structures. Yet, in recent years, there has been a vigorous revival. This book, a unique cooperative effort by the three authors and a group of experts from many countries, offers a fresh analysis of the history of multinational enterprise, taking an integrative approach, not simply comparing national electrification experiences, but supplying a truly global account.

William J. Hausman is Chancellor Professor of Economics at the College of William & Mary. He was president of the Business History Conference, 2006–2007. Hausman has written extensively on the history of the U.S. electric utility industry.

Peter Hertner has just retired as Professor of Economic and Social History at the Historical Institute, Martin-Luther-University of Halle-Wittenberg. He returns to the European University Institute, Florence, Italy. Hertner is an expert on the history of German foreign investments, particularly in the electrical industry and banking.

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# Global Electrification

Multinational Enterprise and International  
Finance in the History of Light and Power,  
1878–2007

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## Series Editors' Preface

The availability of electricity is largely taken for granted in industrialized countries, and yet as the authors of this path-breaking study emphasize, the dissemination of electric power over the last century was a massive endeavor. The distribution of electricity was, the authors show, a global project. We see the enormous importance of global firms, in a wide variety of corporate forms, in electrification before 1914 and after; yet at the same time, a countervailing force mounted, that is, the reduction of the role of these global firms, as governments assumed the responsibility for providing electricity; and then the reemergence in the contemporary era of global businesses as major forces in the world industry. In this and other regards, the spread of electric utilities tells us much about the larger patterns of evolution of the world economy through the vast changes that have occurred as countries industrialized and then moved into the information age. The authors have done research in historical archives located all over the world and in dozens of languages. They have demonstrated a mastery of many different historical literatures. The book points to a new style of “global business history” where the linkages between national experiences are mapped out to become a central explanatory theme, and where national experiences are compared and contrasted rigorously. In short, the authors have created the ultimate work of reference on the electrification of our world.

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## Preface

This book is a cooperative effort by three authors – William J. Hausman, Peter Hertner, and Mira Wilkins – and Dominique Barjot, Jonathan Coopersmith, Kenneth E. Jackson, Pierre Lanthier, H.V. Nelles, John L. Neufeld, Harm Schröter, and Luciano Segreto. It attempts to understand how electric light and power facilities were established and how multinational enterprise and international finance have influenced the course of electrification around the globe. The three authors took the initiative in developing the project. Although electrification is basic to our daily lives, we were convinced that the international business and financial dimensions of its history had been underestimated. The authors assembled a superb group of experts, who have contributed much time and good advice. We were prompted by several considerations:

1. Although there was a huge literature on the spread of global electrification and on the manufacturing companies (the industrial firms), no one had dealt systematically with the history of multinational enterprise and finance in driving forward the lighting up of the world and in providing electric power. Thus, there was a gap to be filled. We wanted to write about the supply of electric light and power, about the utilities.
2. New emphasis on markets – liberalization, privatization, and restructuring from the late 1970s and particularly the 1980s onward – brought with it a resurgence of multinational-enterprise involvements in public utilities and a new globalization. We wanted to study the past in the context of the present because there were obviously historical precedents for today's activities.
3. For one of us (Wilkins), the only nonspecialist on electrification, there was an additional challenge. Wilkins had long been interested in the history of multinational enterprise and in its relationships to international finance. She had been considering forms and conduits

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in international transactions – that is, the actors involved in undertaking foreign investments. The history of electric utilities and their global spread would be a splendid testing ground. All the other participants in this project had written extensively on various cross-border as well as domestic aspects of electric public utilities. Wilkins was in the enviable position of being surrounded by knowledgeable individuals.

4. For all the other participants, this project gave new perspectives. Each was a specialist on particular countries and regions and on particular international connections. Each knew very well a part of the story. What our project offered was a global view. Our group asked, What is distinctive about individual countries and regions and cross-border transactions? What are the legitimate generalizations? What are the common features? How do we think in international rather than conventional national terms? To what extent was information about, and the installation of, electric light and power facilities actually diffused through multinational enterprise and international finance? We looked at change through time. There was nothing static in our approach. And even though we were asking questions relevant to the present, we all understood that history must be approached from evidence, that looking back from the present can distort.

While members of our group come from economics and history departments, we shared the strong belief that good theory must be based on evidence. This is a study based on what happened, as best we can reconstruct it.

The project had its genesis in the early 1990s. Activities on it accelerated after Hausman, Hertner, and Wilkins received approval in May 1999 for a session at the International Economic History Congress (IEHC) in Buenos Aires. At the Business History Conference meetings in Palo Alto, California, in March 2000, Hausman, Hertner, and Wilkins mapped out the plans. Four formal sessions followed: The group had a “pre-IEHC” meeting in Wittenberg, Germany, in May 2001, hosted by Hertner; met in Buenos Aires in June–July 2002 at the IEHC; gathered in Paris in May 2003 as guests of Électricité de France (EDF), with arrangements by Barjot and Hertner; and convened in Lowell, Massachusetts, in June 2003 at a panel organized by Hausman at the Business History Conference. The three authors and Nelles attended all four of these group meetings (and also subsets of them); others attended one, two, or three of the sessions. We have all been in e-mail contact with each other.

It became apparent in our research on global electrification patterns that we would have to pay close attention to technological change and that we would also have to look carefully at the critical roles of governmental

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bodies, as the roles of the latter evolved over the years. We would have to explore the economic and political as well as the business and banking history literature. Multinational enterprise and international finance had to be put into a broad context. We realized that we were making a contribution to modern international economic history. We decided to confine our principal research to the first round of private investors' international participation, from 1878 to 1978. The last chapter brings the story up to date and explains how relevant the topic is in the early twenty-first century. We found that the story of multinational enterprise and international finance was not peripheral but was basic to an understanding of the spread of electrification around the world. Our topic was, in fact, extremely important.

Our initial chapter sets the stage for our findings. It examines the significance of electricity in the modern world, provides some quantitative measures of its spread and extent, and makes the point that a sizable number of households in the less-developed world today still do not have access to electricity. It offers a brief technological survey of electric lighting, power, and traction, emphasizing the importance of large networks and the role of hydroelectricity. The chapter offers evidence on the extraordinary capital intensity of the industry, explores the economic implications of this capital intensity, and demonstrates how crucial this is to our study of multinational enterprise and finance. The chapter also contains a succinct commentary on the role of governments (municipal, state, provincial, and national) in facilitating, regulating, and owning light and power companies. We argue that a governmental role is inherent because of certain fundamental characteristics of the electric utilities sector. Finally, in this framework chapter, we provide our definition of foreign ownership and control and present a basic, newly developed table containing estimates of the percentage of a country's capacity, output, or assets owned or controlled by foreign firms, by country, for benchmark years. This table lies at the heart of our study, revealing how significant foreign ownership and control was to the early history of global electrification.

Chapter 2 treats multinational enterprise and international finance. It is designed to establish a foundation for analysis. It introduces the reader to existing thinking about multinational enterprise and juxtaposes earlier research with the forms and practices we uncovered in our empirical work on the history of global electrification. Because of the capital intensity of electric utilities (as shown in Chapter 1), finance was fundamental. Accordingly, we have sought to understand the interrelationships between multinational enterprise and international finance, the networks and clusters of firms, and the ever-present minority interests. We have found particularly useful the new writings on corporate governance and have tried to integrate others' insights with our own discoveries. For many years, but no longer, theories and descriptions of multinational enterprise were

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dominated by considerations of manufacturing firms; our story is about a service: the supply of electric light and power. To include the latter is perfectly consistent with the newer research on multinational enterprise. Our surprise finding was, however, that although multinational enterprises were ubiquitous in the history of the spread of global electrification, it is inappropriate, for the first century of the industry's existence, 1878–1978, to write on “electric public utility multinational enterprises.” With rare exceptions, operating electric public utilities in these years did not extend internationally. Instead, a variety of forms of multinational enterprise participated in the diffusion of global electrification. This chapter maps the economic actors participating in the process of providing light and power around the world. We explain the differences between foreign portfolio and direct investment. Although the material is often abstract, it should offer a guide to the understanding of the complicated story that follows in the subsequent chapters. Hopefully, this chapter (as well as the documentation of the abstractions in what follows) will contribute not only to our knowledge of how the spread of electrification occurred, but also to the literature on the history of multinational enterprise.

The next three chapters take the concepts put forth in the first two and show chronologically, in considerable detail, the dramatic changes as they transpired over time. Chapter 3 deals with the first movers, the new forms of outward and inward investments that emerged as central power plants proliferated. It documents the spread of the facilities and the extent and characteristics of foreign ownership and control, along with the role of financial intermediaries. By 1914, when Chapter 3 ends, residents of every city around the world had some kind of access to (familiarity with) electricity – whether on a tram, a street corner, possibly at work, or, less likely, at home. This chapter reveals the beginnings of the rise of complex interactions between European and North American capital and entrepreneurship – as inhabitants the world over slowly became aware of the diffusion of electrification. The great creditor nation is the United Kingdom, and its businesses' role in the spread of electrification is weighed vis-à-vis those of many other key actors: American, Belgian, Canadian, French, German, and Swiss, for example. Electrification was piecemeal on all continents and often the result of multinational enterprise expansion. Our interest is in the process of global diffusion, so what happened in colonies and dominions as well as independent nations is included.

Chapter 4 moves the story through time from 1914, when Germans were major players and Russian electrification was dominated by foreign capital, to 1929, when after war, nationalization, restructuring, and renewal there emerged a different configuration of foreign ownership and control and of international finance, assisting in the development of electrification. Continuities and discontinuities are evident. World War I, however, had a dramatic impact by focusing new attention on electrification needs, in

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stimulating new government interventions, and in transforming the already important activities of Belgian and Swiss holding companies. The collapse of the Austro-Hungarian, German, Ottoman, and Russian empires and the forming of new nations affected the electrification mosaic. After World War I, U.S. companies (and U.S. finance) took on a newly heightened role. In the 1920s, no sector attracted greater outward foreign direct investments from the United States than that of utilities. This chapter covers system building as well as the spread of enclave type and power-hungry industrial investments. Foreign direct investment – accompanied by international finance – facilitated the vast extension in the global accessibility of electric light and power. Yet, coincidentally, there was a layering process with the emergence of domestic control in certain countries (thus, for example, nationalization in Russia closed that country to foreign direct investors in electric utilities). The forms of and role of multinational enterprise became extremely complicated, with overlapping international business groups crisscrossing national frontiers.

Chapter 5 turns to the period between 1929 and 1945, when the temporary momentum of multinational enterprise in global electrification was undermined by the worldwide depression, foreign exchange controls, inconvertible currencies, and then World War II. The global electrification of the 1920s with the widespread participation of multinational enterprise carried over to 1930, with ambitious plans for a unified Europe, united with an electric grid developed by multinational enterprise initiatives. Alas, the dream was shattered. The years surveyed in this chapter saw unprecedented risks, uncertainties, and conflicts facing international private-sector investors. Although the demand for electric light and power rose, these foreign investors became less able to fulfill the requirements. Some multinational enterprises retired from existing international commitments. On the other hand, there were also some new, purely financial investments (with particularly large ones in the United States), but not foreign direct investments. For multinational enterprises, which during the 1930s encountered blocked remittances and enlarged governmental interventions (from rate regulations to renegotiated contracts to new legislation), there was little incentive or capability to meet rising expectations. Everywhere, the public and governments recognized that electricity was part of the basic infrastructure. National grids emerged with all the attendant costs. More often than in prior years, there were new government-run activities. And then World War II turned attention to national wartime requirements. The large multinational enterprises persisted and responded in various ways, but there was a nearly complete absence of new entries into international business.

Chapters 6 and 7 pull the previously presented material together, providing conclusions. Chapter 6 is in two parts. It starts with the years 1945 to 1978, when private-sector multinational enterprises were still present – and in some cases even enhanced – yet the handwriting was on the wall, and

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what we have called the “domestication process” (domestic rather than foreign direct investment) picked up speed. The second half of the chapter puts the entire history in perspective, summarizing the domestication process from 1878 to 1978. The rationale for these two sections within Chapter 6 lies in the fact that while there was some new private-sector international investment after World War II, the scenario was increasingly one of an expanded governmental role in the provision of electric power – and if it was not governmental everywhere, there were national (rather than private-sector international) activities in this sector. Our findings are that early in the process of electrification, international private-sector involvements were – or if not initially, soon became – fundamental. Over the years, in a highly uneven manner, there was greater domestication. In some countries, there was more inward international involvement in 1929–1930 than in the decades before World War I. By 1945, however, when Chapter 5 ends, this first wave of multinational-enterprise participation had already begun to show clear signs of dissipating. With the new postwar multilateral financing sources, with the newly enlarged national governmental roles, foreign private-sector activities in electric light and power were dwarfed. On an overall basis, they were increasingly reduced in absolute as well as relative terms. Multinational enterprises continued in this sector; there was private finance, but it had become a shadow of times past. And, at an ever more rapid pace after World War II, in country after country, multinational enterprises in this sector exited. As decolonization brought forth new nations, the latter did not desire foreign private control over the provision of light and power. To be sure, after 1945 there were some few instances of surges of new multinational enterprise-type investments, as in the case of American & Foreign Power Co. in Cuba, which later encountered expropriation with the advent of Fidel Castro. Thus, Chapter 6 contains, along with its summary of the entire domestication process, the story of 1945 to 1978, since by then the trend toward domestication was well under way. For reasons that we subject to analysis over the decades throughout the world, what was once “foreign-owned and -controlled” became domestic, often – but far from always – government-owned. Part of this process of domestication involved nationalization, and part was caused by “creeping” expropriation, where foreign firms found operations untenable. Throughout, private foreign finance persisted, but in the post-World War II years it, too, was muffled. By 1978–1979, when Brascan moved from Canadian to Brazilian ownership, the last of the long-standing, once-large array of foreign-owned and -controlled firms became domestic. The private sector *in terms of foreign ownership and control* was for all practical purposes out of the picture. What was once a truly internationalized private sector became domestic, with only a few remnants of the past remaining. Authors wrote of the “old” foreign investments in public utilities.



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Yet, as soon as the notion of “old investments of another era” was well accepted, privatization, restructuring, and reliance on the market began to become the “talk of the town,” which was especially true by the 1980s and during the 1990s. By the 1990s, there was a dramatic resurgence of international direct investments in the electric utilities sector. New multinational-enterprise investments in electric utilities in that decade and in the early twenty-first century multiplied in both developed and less developed countries. Clusters, networks, alliances, and business groups reemerged. The writers of this history had a certain sense of *déjà vu*. At the same time – by the end of the 1990s and in the early twenty-first century – some of the new international investors were encountering difficulties. We think our story could have predicted some of the problems. A short Chapter 7 reviews some of the new multinational-enterprise involvements of the last decades and considers some of the lessons that emerge from the historical experiences. This is followed by a short conclusion.

To understand the lessons learned, we will discuss populist sentiments as well as conflicts between private goals and public needs and the clash between openness and state intervention. We deal with the special difficulties business enterprises face in investing in electric utilities in a world of fluctuating currencies. Our overall goal is a new narrative and analysis. The outcome is a unique and previously untold story that is fundamental to the economic history of the modern world.



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## Acknowledgments

This is not an edited volume of essays. Instead, it is an integrated study, the result of the close interactions between and among the participants. William Hausman wrote Chapters 1 and 7; Mira Wilkins wrote Chapters 2 through 6; and throughout, Peter Hertner made vital contributions. Note that the first page of each chapter cites in a footnote the main authors and other contributors to the chapter. The phrase “Significant advice from . . .” acknowledges special contributions to the chapter.

In addition to the bountiful and splendid assistance of our core group (listed at the beginning of the preface and in the roster that follows), authors Hausman, Hertner, and Wilkins want to thank individuals from around the world – from North and South America, Europe, Asia, Oceania, and Africa – for the rich contributions that they so generously provided: Robert Aliber, Franco Amatori, Francesca Antolin, Christopher Armstrong, Anna Maria Aubanell-Jubany, Ann Booth, Lisa Bud-Frierman, Bernard Carlson, Alfred Chandler, Andrea Colli, Theresa Collins, John Dunning, Abdel Aziz Ezzel Arab, Maryna Fraser, Patrick Fridenson, Pankaj Gemawat, Andrew Godley, Leo Goodstadt, Peter Gray, Leslie Hannah, Jean-François Hennart, Dina Khalifa Hussein, Paul Israel, Charlotte Jackson, Geoffrey Jones, Stuart Jones, Joost Jonker, Takeo Kikkawa, Makoto Kishida, Christopher Kobrak, Stephen Kobrin, Ginette Kurgan-Van Hentenryk, Pamela Laird, Norma Lanciotti, Daniel Lecuona, Donald Lessard, Reinhold Liehr, Kenneth Lipartito, Robert Lipsey, Andrea Lluch, David Merrett, Rory Miller, Yumiko Morii, Ulf Olsson, Nikos Pantelakis, Ioanna Pepelasis Minoglou, Anders Perlinge, Francesca Pino, Francesca Polese, Samir Saul, Dieter Schott, Jonathan Schrag, Keetie Sluyterman, Richard Sylla, Robert Tignor, Gabriel Tortella, Teresa Tortella, G. P. J. Verbong, Kazuo Wada, and Bernard Yeung. Hausman would like to thank Alan Zoellner, government documents librarian at William & Mary, and Debbie Green, Sarah Stafford, Beth Freeborn, Will Armstrong, and Michael Blum for their gracious technical assistance. This book would not have been possible without the help of all these talented men and women.

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