TARIFFS AND TRUSTS IN THE LATE NINETEENTH CENTURY UNITED STATES

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This paper explores the connection between protective tariffs and market concentration in the late nineteenth century United States. In particular, the paper investigates the effects of the McKinley Tariff of 1890 on American sugar refining and white lead production. My investigation includes a review of contemporary economic thought and political platforms, short histories of both industries, and event studies on the American Sugar Refining Company and the National Lead Company for the passage of the McKinley Tariff.

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1.0 INTRODUCTION

The late nineteenth century was a period of radical social, political, and economic change. In this period, the United States transformed from a "largely agricultural, rural, isolated, localized, and traditional society to one that was becoming industrialized, urban, integrated, national, and modern."[1] In 1870, fifty-two percent of workers were engaged in agriculture, and there were only twenty-five cities in the United States with more than fifty thousand inhabitants. By 1900, however, non-agricultural labor represented sixty percent of the workforce, and seventy-five cities had populations of at least fifty-thousand.[2] Meanwhile, industries consolidated and organized themselves in new ways. These economic giants took advantage of advances in "bureaucratic organization" and set and reached goals based on "rational, conscious, and measurable" standards.[3] At the head of these increasingly complex businesses structures, "salaried managers replaced the small traditional family firm as the primary instrument for managing production and distribution."[4] The consequences of these changes, however, disturbed

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[1] Charles W. Calhoun, "Introduction.," in *The Gilded Age: Perspectives on the Origins of Modern America,* Charles W. Calhoun, Ed. (Lanham: Rowman and Littlefield, 2007), 1.

[2] Ibid., 2.

[3] Glenn Porter. "Industrialization and the Rise of Big Business," in *The Gilded Age: Perspectives on the Origins of Modern America.* Charles W. Calhoun, Ed. (Lanham: Rowman and Littlefield, 2007), 12.

[4] Alfred D. Chandler, Jr. *The Visible Hand: The Managerial Revolution in American Business.* (Cambridge: Belknap Press, 1977), 1.

a wide variety of social critics. The "Gilded Age" of the late nineteenth century was a time of opulence and innovation but also growing ethnic, regional, and class-based conflict.[5]

Two economic issues debated at the national level in the late nineteenth century were the protective tariff supporting American industry and the increasing concentration of enterprises, especially in the form of trusts. With the passage of legislation such as the McKinley Tariff and the Sherman Antitrust Act, both of these issues was the focus of newspaper editorials, national debates, and presidential speeches. By the turn of the twentieth century, consolidations often allowed firms to dominate their respective industries. Between 1895 and 1904, for example, in sixty percent of consolidations a single firm seized control of 62.5 percent of its industry in terms of capitalization.[6] In the sugar refining industry, for example, "the Sugar Trust, later incorporated as the American Sugar Refining Company (ASRC), formed in 1887 as a consolidation of 18 firms controlling 80% of the industry."[7] Meanwhile, the sugar industry was protected by a tariff of "1.25 cents a pound, or 0.5 of a cent a pound more than the average direct cost of refining sugar in the United States."[8] Many other industries, including the lead industry, similarly consolidated and enjoyed significant tariff protection. Hence, tariff protection and industry consolidation were two highly visible and controversial features of the American economic landscape at the end of the nineteenth century.

While many believed the issues were unrelated, some observers connected the increasing concentration of American industry with the protective tariff in place at the time. Henry Havemeyer, the first president of the Sugar Trust and later head of the American Sugar Refining

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[5] Mark Twain and Charles Dudley Warner. *The Gilded Age: A Tale of Today.* (Hartford: American Publishing Company, 1874). Twain and Warner invented the term "Gilded Age" in this book.

[6] Eichner, Alfred S. *The Emergence of Oligopoly: Sugar Refining as a Case Study.* (Baltimore: The Johns Hopkins University Press, 1969), 1.

[7] David Genesove and Wallace P. Mullin. "Testing Static Oligopoly Models: Conduct and Cost in the Sugar Industry, 1890-1914." *The RAND Journal of Economics* (Vol. 29, No. 2, Summer, 1998), 358.

[8] Ibid., 95.

Company, brought attention to this connection when he testified before Congress in 1899, blaming their tariff legislation for the power of his monopolistic enterprise. He claimed,

> The mother of all trusts is the customs tariff bill. The existing bill (tariff of 1897) and the preceding ones have been the occasion of the formation of all large trusts, inasmuch as they provide for an inordinate protection to all the interests of the country, sugar refining excepted.[9]

Throughout the nineteenth century, Congress made numerous changes to the federal tariff schedule, but the McKinley Tariff of 1890 arrived at a crucial moment in the debate on tariffs and trusts. Both the Sugar Trust and the National Lead Trust consolidated in the late 1880s, and President Cleveland signed the Sherman Antitrust Act in July of 1890. In this climate, the debate on the connection between tariffs and trusts reached a high point.

Few historians or economists have specifically devoted much attention to the connection between tariffs and industry consolidation in the Gilded Age, especially at the time of the passage of the McKinley Tariff Act. For example, in his discussion of the McKinley Tariff Act, Edward Stanwood mentions offhand, "It was charged that the tariff created monopolies, to the detriment of consumers, and that it was the mother of 'trusts'."[10] Richard Henry Bensel similarly notes in a footnote that one sixteenth of Democratic Party platforms at the end of the nineteenth century blame protective tariffs for the emergence of trusts, but he does not evaluate this claim in detail.[11] Naomi Lamoreaux discusses the effects of protective tariffs for the Great Merger

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[9] H.R. Doc. No. 476, 56th Cong., 1st Sess., 1899-1900, 101, quoted in Richard Zerbe. "The American Sugar Refining Company, 1887-1914: The Story of a Monopoly." *Journal of Law and Economics* (Vol. 12, No. 2, October 1969), 341.

[10] Edward Stanwood, *American Tariff Controversies in the Nineteenth Century* (New York: Russell and Russell, 1903), 244.

[11] Richard Henry Bensel. *The Political Economy of American Industrialization, 1877-1900.* (Cambridge, Cambridge University Press, 2000), 125n.

Movement of the late 1890s but does not discuss the formation of early consolidations including the Lead Trust and Sugar Trust.[12]

This paper will explore the connection between tariffs and trusts in America in the 1890s by analyzing political points of view and contemporary economic theory and by examining how the McKinley Tariff act affected two industries in the late nineteenth century, American sugar refining and white lead production. The first chapter will explore political platforms in the late nineteenth century, the second will discuss the views of economists, the third and fourth will present the sugar and lead case studies, and the final chapter includes an event study on the Sugar Trust and National Lead Trust for events related to the passage of the McKinley Tariff.

I will argue that, for some politicians, arguments connecting trusts and tariffs were politically convenient because they united the concerns and prejudices of their voting constituencies. Meanwhile, those economists who connected tariffs and trusts believed that tariffs allowed firms to raise prices, strengthening monopoly power. In the end, though tariffs increased the profit margins of trusts already formed, tariffs were neither a necessary nor sufficient factor in the increasing concentration of industries at the end of the nineteenth century. Industrialists, including the leaders of the sugar and white lead industries, tried to consolidate their industries because they recognized the enormous profits available to companies who could eliminate both foreign and domestic competition and control the price and output of their industry's product.

The history of the sugar refining and lead industries demonstrates concretely how trusts took advantage of tariff protective but were not merely the product of tariffs. Though the sugar

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[12] Naomi Lamoreaux. *The Great Merger Movement in American Business, 1895-1904.* (Cambridge: Cambridge University Press, 1985), 97. Lamoreaux argues that protective tariffs may have helped to stimulate the Great Merger Wave since protective tariffs raised company profits, which encouraged entry and greater competition. Industry leaders then tried to reduce this competition by merging with other firms.

refining industry in the nineteenth century enjoyed significant tariff protection, the nature and development of the industry itself favored larger firms and greater consolidation. At the end of the nineteenth century, the sugar trust and the later American Sugar Refining Company emerged because its leaders recognized the enormous profits available to them if they could control the output of their product. Similarly, the leaders of the American lead industry organized the National Lead Trust in the late nineteenth century to avoid domestic competition, but the company also benefited from tariff protection throughout the nineteenth century.

Finally, the event study demonstrates that both the sugar and lead industries experienced abnormal positive returns for events related to the passage of the McKinley Tariff Act. Even though both industries consolidated regardless of the existence of protective tariffs, these protective tariffs certainly benefited these industries.

2.0 TARIFFS AND TRUSTS IN GILDED AGE POLITICS

During the Gilded Age, Democrats and Republicans dominated national political discussion. Thus, to examine the connection between tariffs and trusts, I will first explore the views of the major political parties in the late nineteenth century. In the 1890s, the Republican and Democratic Parties vigorously debated the emergence of trusts and the protective tariff supporting American industry.[13] Often, their debate highlighted fundamental disagreements about the merits of protection and consolidation and about future of the American economy in general.

In the late nineteenth century, the Republican and Democratic Parties laid the foundations for the trade policies that each party maintained essentially until the 1940s. Though the Gilded Age is usually described as a period of political deadlock, the passage of the McKinley Tariff Act in 1890 "boldly proposed…a radical extension of the protective system."[14] Frank Taussig documents the equally radical reaction to this piece of legislation: "Immediately after the passage of the act, the party which had thus espoused the extreme protective policy suffered a crushing defeat."[15] In the November elections after the October passage of the McKinley Tariff, the

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[13] Populists and other minor parties of the time period do not take as clear a stand on the tariffs/trusts debate. In their 1892 Omaha Platform, the Populists asserted their opposition to protective tariffs, a predictable position in light of their argrarian constituency and their usual liberal stances on economic issues. ("People's Party Platform," *Omaha Morning World-Herald* , 5 July 1892, Paragraph 11). However, there is no mention of a connection between tariffs and trusts.

[14] Frank W. Taussig. *The Tariff History of the United States.* (New York: G.P. Putnam's Sons, 1931), 283.

[15] Ibid., 284.

"Republicans were defeated as they had never been defeated before," and in the presidential election of 1892, the White House returned to Democratic control under President Grover Cleveland.[16] The Republicans maintained their support for high-tariff, protectionist policies until the 1940s when the party began to support significant decreases in protective tariffs as part of the Reciprocal Trade Agreements Act of 1934.[17]

The section will explore the philosophies and strategies that served as the basis for the political drama at the end of the nineteenth century. Each party explored a separate set of principles and often tailored its platforms to suit the attitudes and desires of specific groups of voters. The major parties exploited geographic, class, religious, and ethnic divisions.

2.1 DEMOCRATIC PARTY PLATFORMS

For the Democratic Party in the late nineteenth century, both tariffs and trusts represented major issues. The Democrats opposed tariff protective and trust formation on democratic principle: they believed that both institutions favored certain sectors of society, specifically Eastern industrial interests. The Democratic Party's geographic and cultural constituencies may explain the party's stances on these issues and why connecting tariffs and trusts united the concerns of these groups.

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[16] Ibid.

[17] Douglas A. Irwin and Randall S. Kroszner. "Interests, Institutions, and Ideology in Securing Policy Change: The Republican Conversion to Trade Liberalization After Smoot-Hawley." (*Journal of Law and Economics,* Vol. 42. No. 2, October 1999), 643. Irwin and Kroszner argue that Republicans switched sides only as a result of a combination of greater export opportunities and significant "institutional change that strengthened exporters' lobbying" positions."

The Democratic Party exploited opposition to the protective tariff and to large concentrations of wealth in order to unite its voting bloc. For members of the Democratic Party, the tariff was "the object of unmitigated hostility;" this issue "never provoked a party split."[18] To demonstrate the prominence of the tariff issue, Richard Henry Bensel ranks the relative frequency of the appearance of issues in Democratic and Republican Party platforms. According to this measure, the tariff was the number one issue for the Democratic Party in from 1877 to 1896 and the number 4 issue from 1897 to 1900, an overall rank first place relative frequency.[19] In addition to the protective tariff, the topic of industry consolidation also dominated Democratic Party platforms. The issue of trust formation ranks fourth in Democratic Party platforms between 1897 and 1900 and ranks tenth overall between 1877 and 1900.[20] The text of the political platforms themselves reveals not only the Democratic Party's stances towards tariffs and trusts but also provides some clues about why these issues were so divisive.

Democrats argued that the tariff provided inequitable protection and raised the price of raw materials and manufactured goods. The 1892 Democratic Party Platform denounced the protective tariff as the "culminating atrocity of class legislation," arguing that the tariff was disproportionately helpful to powerful business.[21] The Democrats, then, wanted to reduce tariff "in the direction of free raw materials and cheaper manufactured goods."[22] Throughout, the Democratic Party argued that the tariff was inequitable because it provided an unfair advantage to a few while hurting many. Indeed, the Democrats argued that the tariff disproportionately helped some geographic regions. Tariff protection benefited those regions that held protected

[18] Bensel. *The Political Economy of American Industrialization,* 107.
[19] Ibid., 186.
[20] Ibid., 186.
[21] "Political Party Platforms: Democratic Party Platform of 1892." http://www.presidency.ucsb.edu/ws/index.php?pid=29585 (accessed April 12, 2009), paragraph 5. All presidential platforms are listed in the bibliography under Gerhard Peters, "The American Presidency Project."
[22] Ibid., paragraph 5.

industries and was thus very helpful to industrialization in the north.[23] Meanwhile, farmers of the West and South were "forced to buy manufactured goods in a protected domestic market while receiving prices set by an openly competitive world market."[24] Thus, in 1896, the Democratic Party Platform stated that, if there must be a tariff, it at least must be "honestly and economically administered" and "not discriminate between class or section."[25] According to Bensel, "early in this period, Democrats often clothed their opposition to protection as a demand for equitable markets."[26] Similarly, Democrats detected increasing economic inequality among the classes in society when they attacked emerging trusts.

The Democratic Party connected protective tariffs and trusts, arguing that tariffs gave trusts an unfair advantage and thus increased the wealth of a few already rich industrialists. According to the Democrats, the protective tariff "proved a public breeder of trusts and monopolies" and "enriched the few at the expense of the many ."[27] Thus, at the national level, the Democratic Party connected the emergence of trusts with the protective tariff amidst its argument against the protective tariff in general. By the end of the nineteenth century, the connection between tariffs and trusts emerged as its own issue in Democratic and Republican Party platforms. Between 1897 and 1900, the issues of tariffs and trusts were the tenth most frequently mentioned national party plank.[28]

Why did the Democratic Party express so much concern about tariffs and trusts? Joanne Reitano argues that Democrats argued for greater equality in society because they in fact represented nascent social reformers in the spirit of the Progressive Era. The Democratic tariff

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[23] Bensel, *The Political Economy of American Industrialization,* 465.
[24] Ibid., 464.
[25] "Political Party Platforms: Democratic Party Platform of 1896." http://www.presidency.ucsb.edu/ws/index.php?pid=29586 (accessed April 12, 2009), paragraph 11.
[26] Bensel. *The Political Economy of American Industrialization,* 125.
[27] "Democratic Party Platform of 1896," paragraph 11.
[28] Bensel, *The Political Economy of American Industrialization.*, 186.

reformers based their argument against the tariff on the principle that "the protective tariff did not meet legitimate government needs and therefore seemed to serve illegitimate ends."[29] These tariff reformers argued from a foundation of "both political and economic theory," basing their arguments on principles of "limited taxation, equal treatment before the law, and majority rule."[30] Thus, Democrats believed that the tariff protected certain segments of the American population and thus contradicted fundamental American values.

The Democratic Party, on the other hand, did not merely argue that tariffs and trusts benefited the few at the expense of the many. Instead, Democratic politicians worried that tariffs and trusts benefited certain economic groups like Eastern industrialists over others, for example Western farmers. Historian Robert W. Cherny even argues that, at least at the state level, Democrats and Republicans tried to choose a ticket that represented a balance of "the major regions within the state" and "major economic and professional groups."[31] In other words, there is some evidence that at this time the Democratic and Republican Parties actively developed strategies to capture certain groups. In any case, "cultural and religious ideas…affected party allegiances among the voters" at the end of the nineteenth century.[32]

Both the Democratic and Republican Parties attracted voting constituencies based on geography, ethnicity, religion, profession, and other characteristics. In the late nineteenth century, the Democratic Party still captured many votes from Southern whites, by presenting

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[29] Joanne R. Reitano. *The Tariff Question: The Great Debate of 1888.* (University Park: The Pennsylvania State University Press, 1994), 34.

[30] Ibid. 44.

[31] Robert W. Cherny, *American Politics in the Gilded Age: 1868-1900* (Wheeling, Illinois; Harlan Davidson, 1997), 10.

[32] Charles W. Calhoun. "Party Conflict: Republicans versus Democrats, 1877-1901." *The Gilded Age: Perspectives on the Origins of Modern America.* Charles W. Calhoun, Ed. (Lanham: Rowman and Littlefield, 2007), 266.

"themselves as the party of white supremacy."[33] Workers in big cities usually supported the Democratic Party since workers usually supported their local machine and "more big-city organizations were Democratic than Republican."[34] Additionally, the Democratic Party held strong allegiances among Catholics, and "during the Gilded Age, northern Catholics voted Democratic by margins of 70-30 or more."[35] Thus, often particular Democratic platform planks were an attempt to capture votes from Southern whites, urban workers, or Catholics, groups that resented what they perceived to be special advantages granted to increasingly concentrated Eastern industries. For these voters, tariffs and trusts represented institutions of inequality.

2.2 REPUBLICAN PARTY PLATFORMS

While the Democratic Party emphasized equality, the Republican Party argued in favor of the protective tariff supporting American industry believing that tariff protection could help the American economy in its competition with other economies around the world. Similarly to the case of the Democratic Party, the tariff united the Republican Party and for many Republicans was an "unshakable pillar of party identity for the Republicans."[36] Also like Democratic Party platforms, tariffs ranked first in relative frequency from 1877 to 1896 in Republican platforms and third from 1897-1900, also an overall first place relative frequency.[37] The tariff was the major unifying issue for the Republican Party in the late nineteenth century.

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[33] Cherny, *American Politics in the Gilded Age*., 27.
[34]Ibid., 29.
[35] Ibid., 27.
[36] Bensel, *The Political Economy of American Industrialization,* 107.
[37] Ibid., 184.

Their stance on the tariff issue revealed the pro-business stance of Republican politicians. Republicans promoted the protective tariff for American industry, believing that foreign competition could destroy American businesses. The Republican Party Platform stated that Republicans were "uncompromisingly in favor of the American system of protection" and hence opposed "its destruction as proposed by [President Cleveland] and his party."[38] According to the Republicans, by opposing the tariff Democrats served "the interests of Europe" while Republicans supported "the interests of America."[39] While the 1892 and 1896 Republican Party Platforms briefly reiterated their support for the tariff, the 1896 platform added detail.[40] This time, Republicans expressed concern for American workers, arguing that foreign competition with American businesses will force American businesses to compensate for lower prices by reducing wages. According to Republicans, a protective tariff would "protect American labor from degradation and the wage level of other lands."[41] In each of these arguments in support of the tariff, Republicans asserted that foreign competition would be harmful to the American economy.

The Republican Party only occasionally addressed the topic of trust formation. When Republicans did mention trusts, they never defended them. In Republican platforms, the issue of trust formation is the fourth most common party plank between 1897 and 1900 and the tenth most common overall.[42] Though trust formation did not rank as highly as the tariff in national party platforms, the trust was somewhat prominent in state party platforms. In its earlier party

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[38] "Political Party Platforms: Republican Party Platform of 1888." http://www.presidency.ucsb.edu/ws/index.php?pid=29627 (accessed April 12, 2009), paragraph 4.

[39] Ibid.

[40] "Political Party Platforms: Republican Party Platform of 1892. "http://www.presidency.ucsb.edu/ws/index.php?pid=29628 (accessed April 12, 2009), paragraph 2.

[41] "Political Party Platforms: Republican Party Platform of 1896." http://www.presidency.ucsb.edu/ws/index.php?pid=29629 (accessed April 12, 2009), paragraph 3.

[42] Bensel, *The Political Economy of American Industrialization,*184.

platforms of the late 1880s and early 1890s, however, the Republican Party completely evaded the subject of trusts. On the state level, moreover, the Republican Party never defended trust formation. In fact, neither Republicans nor Democrats "ever adopted a plank defending either trusts or industrial consolidation; given the intense public hostility to trusts, public defenders were few and far between."[43] Republicans, therefore, generally avoided the topic of trust formation in public debate.

There is some debate about the success of these Republican Party platforms. Reitano argues that the Republican program was "confessedly protective."[44] According to Republican platforms, the government should adjust tariff rates "to give encouragement to American enterprise, investment to American capital, and employment to American labor."[45] In the nineteenth century, such an economic development program appeared plainly to favor certain segments of American society. On the issue of emerging monopolies, however, Reitano argues that while Democrats opposed the concentration of enormous wealth in the hands of a powerful few, Republican's "tone was defensive."[46] Rather than propose their own solution to the possible problem posed by emerging monopolies, Republicans claimed that "combination was not inherently evil" and that 'the large corporation was nothing but a reflection of quantitative and qualitative improvements in production methods."[47] According to Reitano, therefore, the Republican argument was a mere reaction to the free-market views of the Democratic Party.[48]

Bensel, however, argues that the Republican Party's views were more than a mere reaction to those of the Democratic Party. The Republican Party, he argues, was a

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[43] Ibid., 122.
[44] Reitano, *The Tariff Question,* 46.
[45] Ibid., 46.
[46] Ibid., 73.
[47] Ibid., 73.
[48] Thus Reitano argues, somewhat in contrast to Bensel, that the protectionists forwarded a less developed argument than their Democratic reformer peers.

"developmental agent mediating between democratic claims and the operating requirements of capital investment" and was hence responsible for the coexistence of democracy and development in the United States in the late nineteenth century.[49] According to Bensel, the Republican Party supported industrialization with three policies: "tariff protection for industry, adherence to the international gold standard, and an unregulated national market for labor and production."[50] The international gold standard, while developmentally neutral, allowed the Republican Party to solidify its political base. From that base, they instituted a protective tariff to support American industry and constructed an unregulated national market.[51] In other words, Republican developmental policy formed an American economy free to develop domestically without worrying about economic threats from outside its borders.

On the other hand, Republican Party platforms, like Democratic Party platforms, represented an attempt to court certain sectors of the voting public. While the Democratic Party maintained political strongholds in the South and West, the Republicans concentrated on the North and "held regional bases in New England, upstate New York, Pennsylvania, and the upper Midwest."[52] The gold standard, for example, was a major element of Gilded Age Republican Party policy and "heavily favored the industrial East over the capital-importing West and South."[53] Additionally, voters often identified with the Republican Party based on their religion or ethnicity. In particular, "old-stock New Englanders – those whose families had lived in the United States for several generations – and their descendants across the middle Atlantic and

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[49]Bensel, *The Political Economy of American Industrialization*, xviii.
[50] Ibid.
[51]Ibid., 516.
[52] Ibid., 28.
[53] Bensel, *The Political Economy of American Industrialization,* 355.

Midwestern states were among the strongest Republicans."[54] These New Englanders, often the northern industrialists of the nineteenth century, thus represented an influential constituency within the Republican Party and swayed the party's views on tariffs and trusts.

2.3 CONCLUSIONS

In the end, the political platforms of the major parties in the nineteenth century reflected national concern with economic development, especially with the issues of the tariff and emerging monopolies. According to Richard Franklin Bensel, "economic development dominated national party platforms in the late nineteenth century."[55] For example, the emergence of trusts is significant in the history of American politics because it allowed the Republican and Democratic parties to address major issues of economic development on a level comprehensible to a large portion of the electorate. Party platforms about the relative merits of antitrust legislation "directly addressed the consolidation of the national market."[56]

In sum, the major parties approached the issues of tariffs and trusts in harmony with their general philosophical leanings and respective constituencies. Similarly, the Democrats connected tariffs and trusts out of general suspicion of northern industrialization. In other words, Democrats witnessed the increasing concentration of business and the existence of a protective tariff that disproportionately helped northern industrialization and the wealthy industrialists in control. Republican platforms, meanwhile, appeased northern industrialists, since Republicans denied the connection between the two policies or denied that trusts were in fact a problem.

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[54] Cherny, *American Politics in the Gilded Age*, 28.
[55] Bensel. *The Political Economy of American Industrialization*, 102.
[56] Ibid., 121.

Thus, each party's stance towards the connection between tariffs and trusts follows logically from each party's stance on the individual issues and from the views of each party's voting bloc.

3.0 THE VIEWS OF CONTEMPORARY ECONOMISTS

Economists of the late nineteenth and early twentieth centuries debated the relationship between tariffs and trusts in considerable depth. In this section, I will analyze the writings of economists Henry B. Gardner, James E. Hagerty, Albert Clarke, Frank L. McVey, and Albert C. Whitaker. These economists can be divided into three major groups. First, Henry B. Gardner and James E. Hagerty believed that tariffs supported trusts by allowing the trusts to continue to raise already high prices. Second, protectionist Albert Clarke argued that tariffs could not increase the power of trusts to raise prices, that some trusts could be both hurt and helped by tariffs, and that tariffs could not discourage domestic competition. Finally, Frank L. McVey, Albert C. Whitaker, and Albert Clarke pointed out that tariffs existed long before trusts and that trusts existed in unprotected industries. These arguments, outlined below, provide interesting examples of contemporary economic writings. In general, those who deny a connection between tariffs and trusts voice arguments that agree with modern economic theory.

Henry B. Gardner, professor of political economy at Brown University, and James E. Hagerty, professor of sociology at Ohio State University, believed that tariffs could create or at least increase the power of emerging monopolies. These economists were especially concerned with the ability of monopolies to control prices. In 1906 Gardner, for example, stated that tariffs did not create the trusts but that tariffs certainly increased "the power of the trust to control

prices."[57] Hagerty agreed that tariffs helped monopolies to control prices and wrote in 1906 that since "the determination of price is the fundamental thing in monopoly,"[58] there must be some "definite causal relation between high tariffs and the power of some American trusts."[59] These economists, in other words, believed that the tariff, which was observed to raise the prices of some commodities, must increase the ability of a big company to raise prices for profit. There were, however, several writers who disagreed with this line of reasoning.

Many economists of the late nineteenth and early twentieth centuries did not believe that there existed a connected between tariffs and trusts. Col. Albert Clarke, a vehement supporter of tariff protection and secretary of the Home Market Club, for example, disagreed with the connection made by other economists between high prices caused by the tariff and increased monopoly power over prices.[60] In 1906 Clarke stated, in agreement with modern economic theory, that "high prices are not caused by duties, but by the law of demand and supply."[61] This is somewhat consistent with a contemporary understanding of industrial organization economics. Although a monopoly can "recognize its influence over the market price" and "choose that level of price and output that [maximizes] its overall profits," "the monopoly will be able to sell only what the market will bear."[62] In other words, the power exercised by monopolies like trusts is

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[57] Henry B. Gardner, from Henry B. Gardner, James E. Hagerty, and Albert C. Whitaker. "The Tariff and the Trusts.-Discussion." (*Publications of the American Economic Association*, 3rd Series, Vol. 8 No. 1, Papers and Proceedings of the Nineteenth Annual Meeting, Providence, R.I. December, 1906.), 251.

[58] James E. Hagerty, from Henry B. Gardner, James E. Hagerty, and Albert C. Whitaker. "The Tariff and the Trusts.-Discussion," 251.

[59] Ibid., 252.

[60] "Protectionist to Free Traders: Col. Clarke of the Home Market Club Speaks in Boston," *The New York Times,* March 26, 1896.

[61] Albert Clarke. "The Relation of the Protective Tariff to the Trusts." (*Publications of the American Economic Association,* 3rd Series, Vol. 8 No. 1, Papers and Procedings of the Nineteenth Annual Meeting, Providence, R.I. December, 1906), 211.

[62] Hal R. Varian. *Intermediate Microeconomics: A Modern Approach, Sixth Edition.* (New York: W.W. Norton and Company, 2003), 423.

not limitless; eventually, consumers will find a substitute for a product or simply learn to live without it.

Frank L. McVey, professor of economics at the University of Minnesota from 1896 to 1907, wondered whether tariffs could help trusts at all. Many monopolies faced increased prices on raw materials imported from abroad because of protective tariffs.[63] The Sugar Trust, for example, may have benefited from tariff protection because the firm was protected from foreign competition. However, the Sugar Trust also imported its raw sugar from abroad (primarily from Cuba) and therefore may have benefited from a reduction in the tariff and hence a reduction in raw materials costs. According to Frank L. McVey, trusts or monopolies like "the American Sugar Refining Company and the American Tobacco Company would look with favor upon a reduction in the tariff upon raw material, knowing that their combinations were sufficient to protect them against any foreign competition in refined sugars."[64]

Additionally, Clarke and Professor Albert C. Whitaker pointed out that tariff protection was available to all domestic firms in a certain industry. Thus, the tariff helped monopolists no more than it helped potential competitors. Whitaker, professor of economics at Stanford University, in 1906 wrote, "Tariff protection is open equally to all home producers."[65] In this vein, Albert Clarke noted that one of the greatest effects of the tariff was "to promote domestic competition."[66] Each of these economists doubted that tariffs protected monopolies from foreign competition or gave these monopolies more freedom to control prices, the essential features of the argument connecting tariffs and trusts.

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[63] Frank L. McVey. *The Making of a Town.* (Chicago: A.C. McClurg & Co., 1913), i.

[64] Frank L. McVey. "Trusts and the Tariff." (*The Journal of Political Economy,* Vol. 7 No. 3, 1899), 384.

[65] Albert C. Whitaker, from Henry B. Gardner, James E. Hagerty, and Albert C. Whitaker. "The Tariff and the Trusts.-Discussion," 253.

[66] Clarke. "The Relation of the Protective Tariff to the Trusts," 211.

Furthermore, tariff supporters like Albert Clarke discounted the causal connection between tariff protection and monopoly formation. If tariffs were really the necessary ingredient for trust formation, trusts should have emerged with the passing of tariff protection. According to Clarke, for example, "protection existed [in the United States] a century before any trusts were formed."[67] In addition, they argued that trusts existed in many unprotected industries, indicating that the existence of protective tariffs was in fact not a necessary condition for the emergence of monopolies. According to historian Joanne Reitano, those economists aligned with Republican Party philosophy, for example, often argued that "trusts existed in unprotected industries as well, such as cottonseed oil."[68] In other words, if tariffs were such a vital ingredient in the formation of monopolies, then few monopolies should form without tariff protection. In reality, according to these economists, trusts formed in many industries that did not benefit from tariff protection. Thus, this group of economist argued that, if tariffs were really the proximate cause for trusts, trust formation should often accompany high protective tariffs. They concluded, therefore, that the argument connecting tariffs and trusts was logically flawed.

In the cases of the sugar and lead industries, tariffs existed long before trusts formed, the market limited increases prices, and tariff protection was available to all domestic firms in the industry. In other words, these examples vindicate the views of economists like Albert Clarke and Albert C. Whitaker. Case studies of the Sugar Trust and the National Lead Trust are outlined in the next chapters.

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[67] Clarke. "The Relation of the Protective Tariff to the Trusts," 211.
[68] Reitano, *The Tariff Question,* 73.

4.0 A BRIEF HISTORY OF AMERICAN SUGAR REFINING

By the end of the nineteenth century, the price of sugar affected the daily lives of almost every American, and the American Sugar Refining Company controlled most of the refined sugar industry, a notorious example of industry consolidation. Meanwhile, the American Sugar Refining Company and the earlier Sugar Trust experienced extensive tariff protection. As outlined above, several economists and politicians connected the two prominent features of this industry, tariff protection and market concentration. As mentioned in the introduction, even the sugar industry's de facto leader, Henry Havemeyer, posited that tariffs "are the mother of trusts."[69] By examining the sugar industry provides, we can explore the connection between protective tariffs and emerging monopolies.

In the second half of the nineteenth century, the sugar industry, like many industries in this time, experienced a rapid consolidation. According to Richard Zerbe, "between 1867 and 1887… there was a striking decline in the number of firms engaged in sugar refining from about 52 to 24."[70] Meanwhile, the average plant size greatly increased, and the average sugar firm increased its daily production "from about 200 to about 1,000 barrels per day."[71] In 1887, leaders of the sugar industry gave birth to the Sugar Trust, "a consolidation of 18 firms controlling 80%

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[69] Zerbe. "The American Sugar Refining Company," 341.
[70] Ibid., 340.
[71] Ibid.

of the industry."[72] Its successor, the American Sugar Refining Company, controlled 95% of industry capacity by 1892.[73] Thus, by the end of the nineteenth century, a few powerful industrialists controlled the entire American sugar refining industry.

Meanwhile, the sugar industry enjoyed a substantial protective tariff in the nineteenth century. By 1890 the sugar industry was protected by a tariff of "1.25 cents a pound, or 0.5 of a cent a pound more than the average direct cost of refining sugar in the United States."[74] In fact, in 1887, the tariff on refined sugar stood at eighty-nine percent of the price of sugar.[75] Imported refined sugar, therefore, was 1.89 times as expensive as domestically refined sugar, a huge price advantage for domestic sugar refiners.

Tariff protection represented a key ingredient in the success of sugar refineries in the United States in the nineteenth century. Economists and politicians wondered whether tariff protection was also the key ingredient in the consolidation of the nineteenth century sugar industry. However, although tariff protection helped domestic sugar refining become extremely profitable, the nature and development of the sugar industry itself explains why sugar refining became such a concentrated industry in the nineteenth century. The sugar industry consolidated in the late nineteenth century simply to increase profits.

Larger sugar refiners tended to be more successful than smaller firms for several reasons. First, starting a sugar refining operation required enormous capital because sugar refining was a multistep, complex procedure requiring lots of equipment. To refine sugar, one must first cut, crush, or mash sugar cane in order to extract its liquid. Then, this liquid must be boiled in large

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[72] David Genesove and Wallace P. Mullin. "Testing Static Oligopoly Models: Conduct and Cost in the Sugar Industry, 1890-1914." *The RAND Journal of Economics* (Vol. 29, No. 2, Summer, 1998), 358.
[73] Ibid.
[74] Eichner, *The Emergence of Oligopoly*, 95.
[75] Ibid.

vats at very specific temperatures until sugar crystallizes on the surface of the liquid.[76] This entire process, therefore, required machines to mash or cut the cane, large vats to boil the mash, and a number of devices for extracting the concentrated sugar crystals. Because the industry required lots of equipment, the industry favored the emergence of a few large firms rather than many small firms.

The complex nature of sugar processing highlights another source of high startup costs: labor. A successful sugar refinery required a specialist who knew exactly when and at which temperatures to start and stop this crystallization process. Many early sugar refiners found that their best option for acquiring this kind of skilled labor was to import skill from abroad, especially from England.[77] In fact, two of the skilled sugar men who came to America this way were William and Frederick Havemeyer, progenitors of the family that was to play so important a role in the history of the American sugar refining industry."[78] This skilled labor requirement represented a challenging start-up requirement for a sugar refinery, decreasing possibilities for entry and further favoring the emergence of a few large firms.

Also, given the complex nature of the sugar refining process, any firm that could secure even a small technological advantage gained a significant advantage over competitors, sometimes enough to drive these competitors out of business. As early as 1830, for example, new filtration technology using a substance called bone black, a charcoal made from animal bones, gave some firms a significant advantage over others.[79] Those firms that could secure such new technologies remained in the industry while others exited.

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[76] Sidney W. Mintz. *Sweetness and Power.* (New York: Penguin Books, 1985), 21-22.
[77] Eichner, *The Emergence of Oligopoly,* 28.
[78] Ibid.
[79] Ibid., 31.

Sometimes, a sugar refinery could secure a significant advantage over its competitors from the beginning by securing a favorable plant location. Because the Civil War devastated the Louisiana sugar crop, by 1872, foreign imports of raw sugar accounted for "over 90 per cent of domestic consumption."[80] Therefore, plants located on coastlines could save on the cost of transporting the necessary imported raw sugar to their plants. The Havemeyers benefited from their advantageous plant location near New York City. When "the elder Havemeyer" built a new refinery on the East River in Williamsburg, "it had been recognized that a waterfront site offered certain cost advantage over a location in the heart of Manhattan" because, according to one refiner, "The difference in transportation, lighterage, warehousing, and housing expenses alone is sufficient to pay a dividend."[81] Thus, this geographic advantage could be very helpful to those firms who could locate themselves on a waterfront.

In the period after the Civil War, the sugar industry in the United States behaved very much like a perfectly competitive industry. According to economics textbooks, perfectly (or purely) competitive industries, a consumer's utopia, have several identifying characteristics. First, these industries produce a homogenous product; they do not compete with one another on the quality of their product. Second, in an ideal perfectly competitive industry, there are many – infinitely many – identical firms in the industry. Third and most significantly, these firms have no control over the prices they set for their product. Instead, they set their prices based on the equilibrium of supply and demand in the market.[82] However, for the sugar industry, this perfectly competitive status was inherently unstable, leading to later market concentration.

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[80] Ibid., 42.
[81] Ibid., 55.
[82] Hal R.Varian, *Intermediate Microeconomics,* 380.

In the post-Civil War period, the sugar industry satisfied many of the requirements for perfect competition. Around the Civil War, new technologies in the sugar industry ensured that, for those firms that survived, sugar was a homogenous product.[83] There is also considerable evidence that firms acted as price-takers rather than price-setters; there was a known market price for sugar, and those firms that followed the market price survived.[84] However, according to Alfred Eichner, this near-perfectly competitive arrangement could not last permanently. Because competition forces firms that cannot follow the market price out of business, the sugar industry after the Civil War "was going through a series of convulsions which seemed to suggest that a competitive industry was inherently unstable, for the convulsions were themselves the product of the same competitive character."[85] John E. Searles, secretary and treasurer of the American Sugar Refining Company, later described this period as one of "survival of the fittest."[86] In fact, this competitive period itself increased the concentration of the sugar industry, since "given the large fixed investment required in sugar refining…all but the one or two leading firms found themselves no longer able to cover their full costs."[87] After the Civil War the sugar industry suffered under competitive instability and searched for a more stable, profitable arrangement.

From approximately 1870 to 1887, sugar refiners desperately searched for some way to collude, change tariff legislation, or otherwise drive costs down and prices up in order to survive. These attempts, however, were unsuccessful, leading industry leaders later to explore the trust

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[83] Eichner, *Emergence of Oligopoly,* 46.
[84] Ibid., 47.
[85] Ibid., 49.
[86] John E. Searles. "Chapter XXXVII: American Sugar." *One Hundred Years of American Commerce, 1795-1895: A History of American Commerce by One Hundred Americans.* Chauncey M. Depew, LL.D., Ed. (New York: Greenwood Press, 1968) (Article written in 1895; Author is the secretary and treasurer of the American Sugar Refining Company), 260.
[87] Eichner, *Emergence of Oligopoly*, 50.

form of consolidation.[88] Several firms tried unsuccessfully to convince legislators to change tariff rates in order to secure an advantage for small and medium-sized enterprises.[89] Some small refiners even tried to exploit their connections with powerful bankers to ruin their competitors' credit. However, this scheme had an unfortunate side effect for the small refiners: the major refineries began importing sugar "for their own account," cutting out a middle man, reducing costs, and securing another cost advantage over their small competitors.[90] In 1882, many firms, including the larger enterprises, tried to form a cartel to reduce production and hence increase prices.[91] However, because such cartels were not enforceable by any legal agreement, all firms had incentives to cheat, and the cartel quickly collapsed. After the failure of these attempts at securing profitable stability, sugar firms searched for permanent, cooperative solutions.

In the late 1880s, Henry Havemeyer led the movement to formally consolidate the sugar industry. Havemeyer and his associates, the parents of the Sugar Trust, hired lawyer John R. Dos Passos[92] to advise them on how best to consolidate their industry. He advised them to form a trust rather than one big corporation since a trust would not be "open to public scrutiny."[93] The trust form consolidated the sugar industry by seizing control of a smaller firm, incorporating the firm and assigning "its stock to a board of trustees, and, in lieu of stock, to issue trust certificates."[94] The trust form increased the power of the parent companies since "the voting power stayed with the stock and hence with the trustees, but the earning power was represented

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[88] For full documentation of this period, see Alfred S. Eichner's *The Emergence of Oligopoly,* Chapter 3.
[89] Ibid., 60-62.
[90] Ibid., 60.
[91] Zerbe, "The American Sugar Refining Company," 340.
[92] A relative of the famous American author.
[93] Eichner, *The Emergence of Oligopoly,* 77.
[94] Zerbe, "The American Sugar Refining Company," 348.

by the certificates, held chiefly by the original owners of the refineries."[95] In other words, owners of smaller refineries gave up control of their firms in exchange for enormous profits, a powerful incentive.

This trust formation was indeed extremely profitable. Though the trust did not attempt to control prices directly, "the board of trustees very definitely did attempt to control physical quantities."[96] Since the trust had such a considerable control over the supply of sugar, restricting quantity allowed them to increase the market price. (This is, in fact, exactly the way the OPEC oil cartel controls world oil prices today.[97]) For the sugar trust, restriction of output was in the end a successful strategy. According to Eichner, "in the five years that followed the formation of the trust, the average margin was 1.01 cents a pound, an increase of 18 per cent," which resulted in "a surplus which in 1891 amounted to $7 million."[98] These profits, the result of consolidation alone, were the primary incentive for the trust's formation.

The case of sugar refining suggests that protective tariffs did not stimulate market concentration in the nineteenth century. Instead, industry leaders recognized that great profit margins were available to any industry that could unite its members and restrict production. For example, George Moller of the North River Sugar Refining Company remarked, "We all knew that the only way to make sugar refining pay was to stop over-production."[99] Havemeyer similarly recognized the profit possibilities available from industry consolidation, "comparing the advantages of monopoly with those of oligopoly, and he found the former much more

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[95] Ibid,. 348.

[96] Eichner, *The Emergence of Oligopoly,* 105.

[97] Robert J. Samuelson. "OPEC's Triumph: Acting Like a True Cartel – With America's Help." *The Washington Post,* Wednesday March 12 2008, A19.

[98] Eichner, *The Emergence of Oligopoly,* 118.

[99] U.S. Congress, House of Representatives, Committee on Manufactures, *Report on Trusts,* 50th Cong., 1st sess., 1888, H. Rept. 3112, 144-49, quoted in Eichner, *The Emergence of Oligopoly,* 71.

attractive."[100] Richard Zerbe summarizes the story of the sugar monopoly aptly, arguing that "the proximate reason for the sugar monopoly was that at that time its formation was both profitable and possible."[101]

In the case of the sugar trust, the profits available through concentration, not a protective tariff, stimulated industry concentration. The case of the whiskey ring, on the other hand, demonstrates exactly what kind of protective tariff or tax break would have to be in place to encourage the formation of monopolies. The whiskey ring operated for four years immediately after the Civil War. In an ingenious scheme, "with the connivance of Federal agents, certain favored distillers were able to avoid paying the seventy-five-cents-a-gallon excise tax on at least 50 per cent of the whiskey they produced, half the money saved going to the distillers themselves and half to the leading Republican politicians who had organized the scheme."[102] These favored distillers secured such a cost advantage that potential competitors were forced out of the industry, consolidating the whiskey ring as a single price-setting entity.

At first glance, the case of the whiskey ring appears to be a counterexample to the case of the sugar trust. However, during this period in the whiskey industry, certain producers secured an advantage over other producers. Later, in the late 1887, after several of these kinds of pools arose and failed, distillers formed a consolidation known as the Distillers and Cattle Feeders Trust.[103] At the time that this true trust formed, the whiskey industry did not benefit from any kind of protective tariff. Similarly, in the case of sugar refining, all firms benefited from the same protective tariffs situation; there were no favored producers. During the formation of the

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[100] Ibid., 72.
[101] Zerbe, "The American Sugar Refining Company," 339.
[102] Eichner, *The Emergence of Oligopoly,* 51.
[103] Werner Troesken. "Exclusive Dealing and the Whiskey Trust." (*The Journal of Economics History.* Vol. 58 No. 3, 1998), 759.

sugar trust and later the American Sugar Refining Company, the protective tariff did not give the trust any advantage over other domestic producers. To generalize, for a protective tariff or tax policy to stimulate the emergence of trusts, that policy must give certain members of an industry an advantage over not just foreign competition but domestic competition as well. Trusts can only reap enormous monopoly profits by removing all possible competition.

After its initial formation and first wave of profits, the Sugar Trust made a few changes in its organization to secure its position for the long term. None of these changes considered the existence of a protective tariff. The first major change in the trust's organization was a reaction to the outcome of the North River Refining Case in 1890. The case ruled that the Sugar Trust was an illegal combination according to the laws of the state of New York. In reaction, the trust altered its structure and became the American Sugar Refining Company (ASRC), a holding company incorporated in New Jersey in order to avoid prosecution.[104] The company controlled an overwhelming share of refined sugar production and in 1892 controlled as much as ninety-one percent of the industry (See Appendix B). The federal government attacked the ASRC in court, charging that the new organization was still a violation of the Sherman Antitrust Act. However, when the United States Supreme Court heard the *E.C. Knight* case, the court ruled that the ASRC did not violate the law. Since the *E.C. Knight* case was one of the first attempted prosecutions using the Sherman Act, the case "seemed to strike down the antitrust law itself."[105] With this decision in the Knight case, the American Sugar Refining Company held its controlling position in the sugar refining industry, sending a clear message to other industries that such extremely profitable combinations could avoid prosecution in the United States for the time being.

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[104] Searles, "Chapter XXXVII: American Sugar," 260.
[105] Eichner, *The Emergence of Oligopoly,* 152.

In order for any monopoly to maintain its profits, it must solve the problem of entry. New firms could always enter the industry, refuse to cooperate, and steal the old monopoly's customers by setting its price slightly lower than the old price. The American Sugar Refining Company had several ingenious methods to solve this entry problem. Again, none of these measures involved a protective tariff. First, the American Sugar Refining Company (ASRC) made an "arrangement with the wholesale grocers under which the latter refused to handle the sugars of any proscribed company."[106] It would have thus been very difficult for any new refiners who refused to join the monopoly to market their product. The ASRC also secured an exclusive deal with railroad companies in the form of the receipt of rebates and other concessions from the railroads, which provided the American with a substantial advantage in shipping costs."[107] Similarly, this measure effective deterred entry since any new refiner would find itself at a significant disadvantage. The fact that the ASRC took these steps to deter new companies from entering the refined sugar market demonstrates what a weak factor the tariff really was. Because the protective tariff was insufficient to protect trusts from new domestic competition, trusts erected these kinds of significant entry barriers.

The American Sugar Refining Company became Domino Sugar in 1900. Until approximately the 1930s, the company restricted production successfully, raising the price of refined sugar and bringing considerable wealth to the monopoly's architects. The sugar monopoly aroused public interest and reaped such enormous profits perhaps because "sugar had become an important part of daily consumption."[108] Many noticed that the sugar monopoly, once formed, could set its prices even higher than the American market permitted because

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[106] Ibid., 188.
[107] Ibid.
[108] Ibid., 126.

domestic sugar benefited from a protective tariff. However, the ASRC's architects designed their combination to restrict domestic competition; sugar consolidation was not simply a natural consequence of tariff protection.

On the other hand, the Sugar Trust supported the passage of the McKinley Tariff Act, because industries leaders believed that increased protective tariffs on refined sugar could restrict international competition and allow the trust to raise prices. The McKinley Tariff Act enacted two important changes for the sugar industry: it eliminated the tariff on imported raw sugar and increased the tariff on imported refined sugar.[109] This allowed the Sugar Trust to import its major input duty-free while excluding foreign competition in refined sugar.

Thus, this change to the tariff schedule was doubly helpful to the American Sugar Refining Company, and this was public knowledge. The *New York Times* reported how "the sugar men" arrived in Washington during the debate on the McKinley Tariff, and how once legislators heard the arguments of these "sugar men," "the schedule was changed, and the Trust's duty of one-sixth of a cent was raised to four-tenths of a cent."[110] The *Times* also called the McKinley Tariff a "bill that the Sugar Trust magnates have had molded to their own satisfaction and profit."[111] Moreover, John E. Searles, Treasurer of the American Sugar Refining Company, stated publicly that he "has no doubt that the effect of the McKinley Tariff bill will largely increase the business of the Sugar Trust."[112] Therefore, the event study should show some positive effect from the passage of the McKinley Tariff Act, though it is possible that the "sugar men" expected the actual passage of the bill early in the process.

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[109] Zerbe, "The American Sugar Refining Company," 345.
[110] *New York Times,* June 18, 1890.
[111] *New York Times,* June 22, 1890.
[112] *New York Times,* October 4, 1890.

5.0 A BRIEF HISTORY OF THE AMERICAN LEAD INDUSTRY

The melting, smelting, and manufacture of lead and lead products in the Americas predates the founding of the United States. As early as 1621, settlers mined for lead in Falling Creek, Virginia.[113] However, before the nineteenth century, Americans in the lead industry produced on a very small scale, and one of the most important lead products, white lead, did not even come into prominence in the industry until the middle of the nineteenth century. By the end of the nineteenth century, the National Lead Trust, which later became the National Lead Company, led production in several lead products but especially dominated the market for white lead, an important ingredient for paint production. The history of the National Lead Company in many ways parallels that of the American Sugar Refining Company. Both companies enjoyed significant tariff protection and concentrated their industries at the end of the nineteenth centuries. Journalists also theorized that the Lead Trust should benefit from the passage of the McKinley Tariff Act.

Henry P. Thompson, president of the National Lead Company, commented in 1895 that before 1795 "minor workings in the Eastern States, while they produced but a comparatively

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[113] Elizabeth S. May. "Chapter XI: The Lead Industry in the United States". *International Control in the Non-Ferrous Metals*. William Yandell Eliot; Elizabeth S. May, J.W.F. Rowe, Alex Skelton, and Donald H. Wallace. (New York: The MacMillan Company, 1937), 663.

small output, were the only real American interests" in lead.[114] According to Thompson's nineteenth century essay from *One Hundred Years of American Commerce*, the manufacturing of silver was the major stimulus to the American lead industry early in the nineteenth century, since "Western lead ores were, almost without exception, very rich in silver."[115]

However, as president of the National Lead Company, he emphasizes that "the chief of all the products of lead manufacture is…the carbonate, which is…the white lead of today," and this is used "as a pigment and base for colors."[116] White lead is the chemical compound $(PbCO_3)_2 \cdot Pb(OH)_2$. The substance has an opaque, white appearance and is thus a good pigment base for paint. According to Thompson, white lead became popular after the Revolutionary War, when "more luxurious customs and greater pretensions were indulged in by the citizens of the new Republic, and the use of paint became general in the cities."[117] During the Civil War, production of white lead slumped slightly when "the introduction of the manufactured zinc oxide as a substitute for white lead, together with the advance in the price of metallic lead under the strong influence of the wartime demand, checked the use of the manufactured product until the return of better times at the conclusion of the war."[118] Like the sugar industry, after the Civil War, harsh competition characterized the lead industry, and industry leaders desperately searched for a solution to such ruinous competition.

Thompson's article, in fact, bluntly describes the consolidation of the lead industry. Soon after the Civil War, lead industry leaders sought solutions to the harsh competition facing the industry. He notes that, as "early as 1870 the tendency toward consolidation rather than

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[114] William P. Thompson. "Chapter LXIV: The Lead Industry." *One Hundred Years of American Commerce, 1795-1895: A History of American Commerce by One Hundred Americans.* Chauncey M. Depew, LL.D., Ed. (New York: Greenwood Press, 1968). (Articles are dated 1895), 430.

[115] Ibid., 435.

[116] Ibid., 436.

[117] Ibid., 437.

[118] Ibid., 438.

individual extension was already noticeable."[119] The following excerpt from his article clearly describes the efforts of business owners to eliminate competition for the purpose of increasing profits and is a particularly crisp example of late nineteenth century trust consolidation. He states,

> The manufacture of white lead in former years had been very profitable, which had induced the building of an unnecessarily large number of factories in different sections of the country, which in turn brought on severe competition, and many of the factories became unprofitable. In order to lessen this competition various devices of association were successively tried, and failed, until at last, in 1887, a number of factories came together in an association practically similar to the then existing Standard Oil Trust.[120]

Though this original combination was unsuccessful, soon the leaders of the lead industry asked Mr. Thompson to become president of a reformulated National Lead Trust. By 1889, the National Lead Trust manufactured about eighty percent of white lead, seventy percent of red lead, fifteen per cent of linseed-oil, ten percent of sheet-lead, nine percent of lead pipe, and sixty percent of lead acetate produced in the United States.[121] The *New York Times*, however, repeatedly claimed that the National Lead Trust controlled as much as ninety-seven percent of the overall lead industry by 1890. On January 6, 1890, one *Times* reported accused the trust of "arbitrarily raising the price of its product by 10 per cent," commenting that "it is well known that the Trust includes about 97 per cent of the productive capacity of the industry."[122] Another article even compares the Lead Trust to the Sugar Trust, calling the Lead Trust "a more comprehensive ring than Sugar Trust."[123] Thus, at the time several commentators believed that the National Lead Trust enjoyed extensive control of the lead industry and even exercised its

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[119] Ibid., 440.
[120] Ibid., 440.
[121] Ibid.
[122] *The New York Times*, January 6, 1890.
[123] *The New York Times,* August 2, 1890.

ability to choose prices. These writers believed that the consolidation of the Lead Trust, like the Sugar Trust, allowed the consolidation greater price-setting control.

In 1891, the leaders of the National Lead Trust dissolved the company and formed a corporation under New Jersey law, the National Lead Company.[124] The National Lead Company controlled not only the white lead industry but also the principal lead smelting companies.[125] National Lead became NL Industries on April 15, 1971. NL Industries still exists today as a conglomeration of several metals and plastics companies, including Kronos Worldwide, Inc. and CompX International, Inc.[126] The National Lead Trust, therefore, discovered an arrangement that not only "saved" industry leaders from the disastrous effects of competition but also in part enabled the company to survive throughout the twentieth century.

Like the sugar industry, the lead industry in the United States enjoyed a protective tariff for almost its entire existence, and some believed that these tariffs were an important ingredient to the trust's formation. In one pamphlet from 1900, for example, George Macbeth charges that there was a significant difference in the price of lead in New York and that in London and that "this lead combine has arisen, and is a result of the tariff on lead," that it "could not exist without this tariff, and that "it is the very perfection of a trust or combine brought into existence by the government."[127] Thus, similar to the case of the Sugar Trust and similar to the argument of economists Henry Gardner and James Hagerty, Macbeth argues that the protection tariff allowed the Lead Trust to raise prices and take advantage of the international market for lead. Though

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[124] Thompson, "The Lead Industry," 440.
[125] May, "The Lead Industry in the United States," 667.
[126] "NL Industries." Available: www.nl-ind.com/home.nsf. Accessed February 12, 2009.
[127] George A. Macbeth, *The Lead Trust: American Lead a Pound Less in England than Here.* (Pittsburg [sic], 1900.)

the lead trust actually formed as an attempt to disrupt domestic competition, the lead industry did, in fact, benefit from significant tariff protection.

Elizabeth S. May charted the history of the lead tariff in her essay on the history of the American lead industry. According to May, tariff protection for the lead industry began in 1789, and the federal government made several changes to the tariff schedule for lead throughout the nineteenth century.[128] Congress reduced the tariff on lead in 1846 and 1857; then raised the protective tariff in 1861, 1862, 1864; and then reduced the tariff again in the 1880s.[129] Throughout nineteenth century United States history, the federal government did not pursue a consistent policy towards tariff protection for the lead industry.

Often, Washington changed the tariff schedule in response to protest by manufacturers in the East who used lead as an input, and thus wanted a reduction in the tariff, and by lead producers in the West, who favored greater protection of their industry. For example, in the early 1880s Eastern manufacturers successfully lobbied for a reduction in the tariff on lead.[130] Even though Western lead producers convinced Congress to raise the tariff on certain products, including sheet lead, the producers soon encountered another challenge.[131] In 1886, for the first time in the history of the American lead industry Mexican producers sold a significant quantity of lead in the United States. Panicked domestic lead producers lobbied for an increased protective tariff. Unfortunately for lead producers, the Tariff Commission in 1886 ruled that the Mexican ore, because it contained a greater percentage of silver ore than of lead ore, must be imported into the United States completely duty free since there was no regulation in existence

[128] May, "The Lead Industry," 663.
[129] Ibid., 664 and 665.
[130] Ibid., 666.
[131] Ibid., 666.

for such composite ores.[132] However, the lead industry continued to lobby for a reversal of this decision.

The McKinley Tariff of 1890 settled the Mexican ore debate in favor of United States lead producers. The tariff act "enacted that on the lead content of a composite ore there should be a duty equivalent to the duty on lead."[133] Furthermore, reports from the *New York Times* indicate that the lead industry and especially the National Lead Trust had high hopes for the McKinley Tariff Act. On March 24, 1890, before the McKinley Tariff bill had left the hands of the House Ways and Means Committee, the *Times* reported that the National Lead Trust convinced the committee to retain its "entire duty of 3 cents a pound on white lead."[134] Then, on May 28, 1890, one *New York Times* headline yelled,

> CARBONATE RING HAPPY: SUCCESSFUL IN SAVING PARAGRAPH IN THE TARIFF. A LONG DEBATE ON THE LEAD-BEARING ORE CLAUSE – A MILLION DOLLARS IN THE POCKET OF ONE MAN.[135]

The House had just passed the Tariff bill, and in the House version of the bill, the National Lead Trust had already succeeded in convincing Congress to tax the lead-silver ore from Mexico. On September 14, 1890, four days after Senate passed the McKinley Tariff, the *New York Times* reported that the Lead Trust "may feel reasonably confident, therefore, that it will continue to be protected by a tariff wall of 3 cents a pound, or from 70 to 75 per cent. [sic] ad valorem."[136] Therefore, because the an increase in tariff rates could protect the Lead Trust from foreign competition, the passage of the McKinley Tariff Act was seen as helpful for the National Lead Trust.

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[132] Ibid., 667.
[133] Ibid., 667.
[134] *New York Times* March 24, 1890.
[135] *New York Times* May 28, 1890
[136] *New York Times* September 14, 1890.

6.0 EVENT STUDY

As explained in the previous chapters, Sugar and Lead Trust executives as well as newspaper writers believed that the McKinley Tariff would increase the profits in the American lead and sugar industries. One way to test the effects of such a piece of legislation and whether the passage of the bill was anticipated by shareholders is to perform an event study on the market returns of each company.

Event studies measure changes in the value of an asset, in this case stock prices, to an announcement, or event. In the case of stock prices, an event study measures whether a company listed on the stock exchange experiences unusually large or small returns relative to a control group, called the market portfolio. Often, these studies are used to evaluate mergers or other corporate announcements. Under the assumptions of the efficient-markets hypothesis they may also be used to study the effects of a regulatory event like the passage of the McKinley Tariff Act.[137] This study in particular will test the null hypothesis that the Sugar and Lead Trusts did not experience abnormal returns for the passage of the McKinley Tariff Act against the alternative hypothesis that there were, in fact, some abnormal returns.

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[137] G. William Schwert. "Using Financial Data to Measure the Effects of Regulation." (*Journal of Law and Economics*, Vol. 24, No. 1, 1981), 121.

6.1 METHODOLOGY AND DATA

As a first test, I will first estimate the returns of the stock prices for the National Lead Trust and the Sugar Trust two months[138] before the announcement of the tariff bill and two months after the bill signed by the president (the "out-of-sample window") using the following standard model:[139]

$$R_{it} = a_i + b_i R_{mt} + e_{it}, \qquad \{t < 38\} \cup \{t > 176\}$$

where we have $R_{it} = \frac{p_{it} - p_{i,t-1}}{p_{i,t-1}}$,

and where p_{it} is the closing price of company i's stock at time t.

The source for this stock price data was New York Stock Exchange quotes from the *New York Times*.[140] From the standpoint of the data available, the Sugar Trust and the Lead Trust are ideal companies to study because each company is listed every day on the New York Stock Exchange. Furthermore, though a significant market for industrial securities did not develop until approximately the turn of the twentieth century, Thomas Navin and Marian Sears note that "the first industrial companies to attract on a large scale the attention of the investing public were to be found not in manufacturing or distribution but in processing (oil refining, sugar refining, lead smelting, and the like)."[141] Thus, the lead smelting and sugar refining trusts are ideal trusts to study for this particular event window.

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[138] Usually, one month of observations before and after the event is considered sufficient, but especially given the complexity and number of events (see Table 1), two months of data points on both sides of the event will provide better information about conditions in the sugar and lead industries outside of the event window.

[139] John J. Binder. "Measuring the Effects of Regulation with Stock Price Data. (*The RAND Journal of Economics,* Vol. 16 No. 2, Summer 1985), 170.

[140] The prices used in this study are the closing prices from the New York Stock Exchange. During this period, the symbol for the Sugar Trust (and later American Sugar Refining Company) was "Sugar Ref. Company," and that for the National Lead Trust was "Nat. Lead Trust."

[141] Thomas R. Navin and Marian V. Sears. "The Rise of a Market for Industrial Securities, 1887-1902." (*The Business History Review,* Vol. 29, No. 2, 1955), 112. For more information on the condition of United States

The market returns are the returns on a portfolio of companies from the New York Stock Exchange, specifically the 12 Stock Average compiled by Dow Jones.[142] These companies, mostly railroads and other transportation services, should not experience any effects from the passage of the tariff act.[143] Thus, this group of twelve stocks serves as an adequate control group for the effects of the tariff's passage. A complete list of stocks in this portfolio appears in Appendix A.

To determine the effect of events along the passage of the McKinley Tariff Act, I will measure the abnormal return $AR_{it} = R_{it} - (a_i + b_i R_{mt})$, where R_{it} is company i's actual return at time t and $a_i + b_i R_{mt}$ the predicted return for company i for all days t.

Both the National Lead Trust and the Sugar Trust reacted to events related to the passage of the tariff act as well as to events that only affected each company individually. In the case of the Sugar Trust, these company-specific events represent key dates in the history of the company.

On April 16, 1890, William McKinley, Chairman of the House Ways and Means Committee, officially reported the bill that became known as the McKinley Tariff bill to the House of Representatives (MCREPORT). General debate on the bill in the House of Representatives lasted from May 7 to May 10, 1890 (DEBATE), and the House finally passed

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financial institutions before the turn of the century, see: Gene Smiley. "The Expansion of the New York Securities Market at the Turn of the Century." (*The Business History Review,* Vol. 55, No. 1, 1981) and Larry Neal. "Trust Companies and Financial Innovations, 1897-1914." (*The Business History Review*, Vol. 45, No. 1, 1971).

[142] Pierce S. Phyllis, Ed. *The Dow Jones Averages: 1885-1985: Centennial Edition.* Dow Jones-Irwin, 1986. The 12 Stock Average predates the Dow Jones Industrial Average.

[143] According to Peter Turfano, many of these railroads experienced significant financial distress in the second half of the nineteenth century. Fortunately, estimating $R_{it} = a_i + b_i R_{mt} + e_{it}$ both before and after the beginning of the event window controls for this difference in distress between the sugar and lead trusts and the market portfolio. See: Peter Turfano. "Business Failure, Judicial Intervention, and Financial Intervention: Restructuring U.S. Railroads in the Nineteenth Century." (*The Business History Review*, Vol. 71, No. 1, 1997) for more details on distress in the railroad industry.

the bill on May 21 (HOUSEPASS). The Senate passed the bill on September 10, 1890 (SENATEPASS). President Cleveland signed the bill into law on October 1, 1890 (SIGNED).[144]

Several dates within the event window may have corresponded to a significant drop in stock price for the Sugar Price. On March 15, 1890, the *New York Times* reported that stockholders discovered that the Sugar Trust carried a large outstanding debt, resulting in a drop in the stock price of the Sugar Trust (DEBTFOUND).[145] On April 4, 1890, the Sugar Trust completed a deal for railroad rebates with the Erie Dispatch Company (RAILROAD).[146] Sugar Trust executives made a special trip to Washington to lobby for the passage of the tariff bill on April 18, 1890 (LOBBY). Most significantly, the Sugar Trust faced a significant legal battle during the month of June. Several times, the Sugar Trust's stock price fell significantly on rumors that the trust would be ruled illegal in the state of New York (NRRUMOR1, NRRUMOR2) in the North River Refining Case. At the end of the month, in fact, the judge in the North River Refining Case ruled the trust illegal (NRRULING), but the trust quickly rebounded and reorganized as a corporation, the American Sugar Refining Company, under New Jersey Law (NEWJERSEY).

The Lead Trust experienced a few events that may have affected its stock within the event window. First, on March 22, 1890, the *New York Times* reported that the Lead Trust saved a three cent per pound duty on finished products in the tariff bill (KEEPDUTY). Next, on May 28, the trust successfully convinced Congress to maintain an especially helpful paragraph in the tariff schedule (KEEPPARAGRAPH).

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[144] Dates are from Edward Stanwood, *American Tariff Controversies of the Nineteenth Century,* 1903.

[145] "Sugar Trust Woes: Wall-Street's Discovery of a Heavy Floating Debt," *New York Times,* March 15, 1890.

[146] *New York Times,* April 4, 1890.

Table 1 summarizes the events for the Sugar Trust, Lead Trust, and the McKinley Tariff Act, which should affect both companies. Since I collected stock quotes daily, I have also listed the day number as well as the date for easy reference.

Table 1: Significant Events for Sugar and Lead

Sugar Trust Events	Day Number	
DEBTFOUND	13	Significant outstanding debt discovered (March 15, 1890)
RAILROAD	36	Strikes rebate deal with Erie Dispatch Company (April 4, 1890)
LOBBY	40	In Washington to lobby for the tariff (April 18, 1890)
NRRUMOR1	79	Stocks plummet on rumor of a ruling in the North River Case (June 4, 1890)
NRRUMOR2	94	More North River Case rumors (June 22, 1890)
NRRULING	96	Trust ruled illegal in North River Refining Case (June 25, 1890)
LETTER	111	Issues reassuring letter to certificate holders (July 16, 1890)
NEWJERSEY	112	Trust to reorganize as New Jersey Corporation (July 17, 1890)
Lead Trust Events		
KEEPDUTY	19	Lead Trust said to retain 3 cent/lb duty (March 22, 1890)
KEEPPARAGRAPH	74	Lead Trust saves helpful paragraph in the Tariff Bill (May 28, 1890)
Regulatory Events		
MCREPORT	38	McKinley, chairman of the Committee on Ways and Means, reports the tariff bill (April 16, 1890)
DEBATE	56-59	General debate on the McKinley Tariff bill (May 7-10, 1890)
HOUESEPASS	68	McKinley Tariff is passed by the House of Representatives (May 21, 1890)
SENATEPASS	160	McKinley Tariff is passed by the Senate (September 10, 1890)
SIGNED	176	McKinley Tariff is signed by the President (October 1, 1890)

Day Number shows the ordinal number of the stock quote, starting with March 1, 1890 and proceeding Monday through Saturday (except holidays) until November 29, 1890.

6.2 RESULTS

Both the Sugar Trust and the Lead Trust show evidence of abnormal returns throughout the event window, as shown in Figures 1 and 2. Thus, there is evidence that the Sugar and Lead Trusts experienced beneficial effects from the passage of the McKinley Tariff Act.

On the other hand, close examination of those graphs reveals a few dramatic decreases, especially for the Sugar Trust. Many of these effects can be explained by the company-specific events listed in Table 1. For example, on Figure 1, there is a dramatic decrease in the Cumulative Abnormal Return for Sugar between approximately days 60 and 80. Meanwhile, on day 79, the Sugar Trust's stock plummeted dramatically in response to rumors that the trust would be ruled illegal in the North River Case (NRRUMOR1). Later, between days 80 and 100, the cumulative abnormal return plummets again in response to more events related to the North River Case (NRRUMOR2, NRRULING). In the case of the Lead Trust, there is a small positive spike in the cumulative abnormal return corresponding to day 74 (KEEPPARAGRAPH), when the Lead Trust was able to secure a beneficial paragraph in the Tariff Bill.

Several dates related to the passage of the McKinley Tariff Bill show dramatic responses in the graphs of the cumulative abnormal returns for both companies. Both companies show dramatic positive spikes close to day 68 (HOUSEPASS) and strong upward progressions through SENATEPASS and SIGNED. Thus, the cumulative abnormal returns for the Sugar Trust and the Lead Trust for the event window can be explained by the events for each specific company in combination with the events for the passage of the McKinley Tariff Act listed in Table 1.

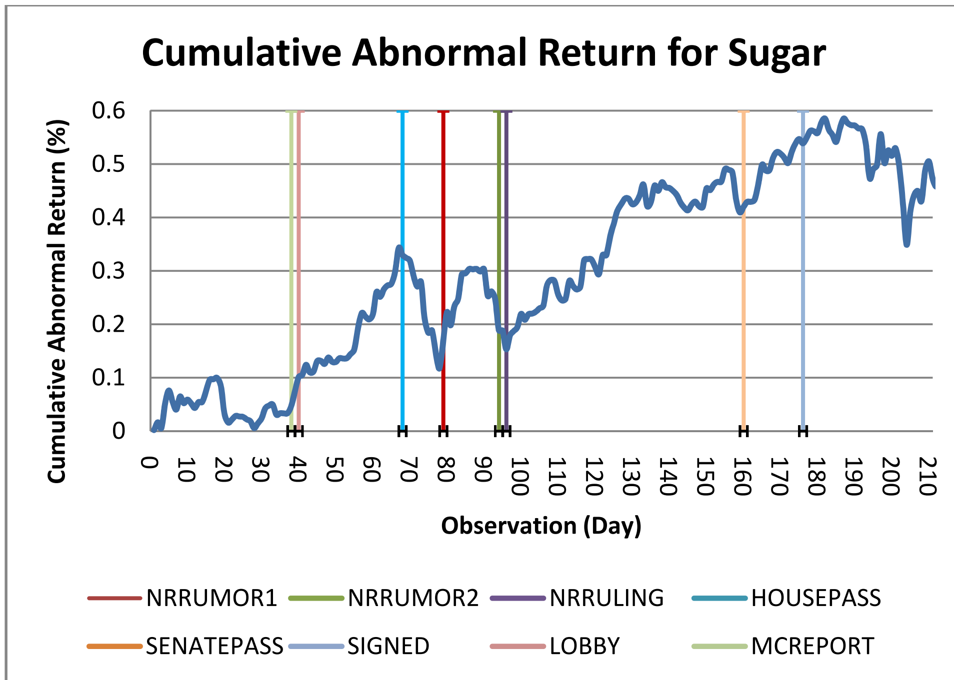

Figure 1: Cumulative Abnormal Return for Sugar

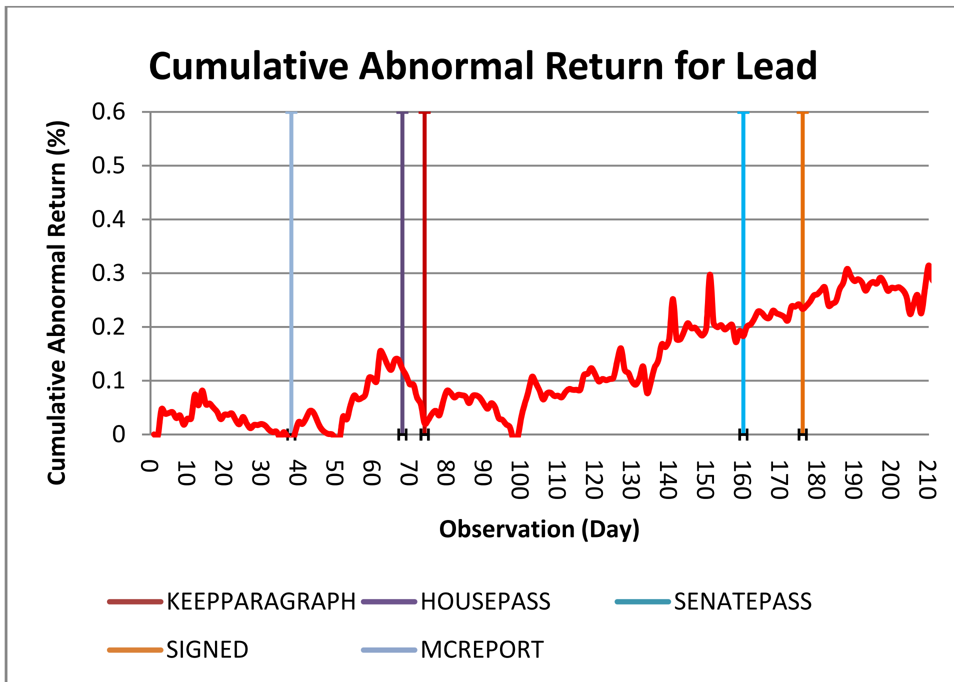

Figure 2: Cumulative Abnormal Return for Lead

One way to test the significance of these events is to examine each company's residuals e_{it} for the regression $R_{it} = a_i + b_i R_{mt} + e_{it}$. To test these deviations for significance, one can calculate studentized and standardized residuals.[147] As shown below, the standardized and studentized residuals in this case are very similar, where the standardized residual is given by $r_i = \frac{e_i}{s_{i^*}}$, s_i^* is an estimate of the variance of e_i, and $r_i \sim N(0,1)$.

Table 2: Results for the Sugar Trust

Event	Expected Sign	Residual Value	Studentized Residual	Standardized Residual
DEBTFOUND	−	-0.00854	-0.30949	-0.31117
RAILROAD	+	-0.00022	-0.00794	-0.00799
LOBBY	+	0.026208	0.95408	0.95459
NRRUMOR1	−	0.051515	1.905399*	1.876247*
NRRUMOR2	−	-0.05885	-2.19154**	-2.14356**
NRRULING	−	-0.03499	-1.28169	-1.27682
LETTER	+	-0.01095	-0.39693	-0.39894
NEWJERSEY	+	0.003071	0.111185	0.111844
MCREPORT	+	0.013195	0.478403	0.480614
DEBATE	+	0.039451	1.447827	1.438472
HOUESEPASS	+	-0.01309	-0.47501	-0.47722
SENATEPASS	+	0.010114	0.367343	0.369249
SIGNED	+	-0.00803	-0.29119	-0.29279

*Significant at the 10% level.
**Significant at the 5% level.

Table 3: Results for the National Lead Trust

Event	Expected Sign	Residual Value	Studentized Residual	Standardized Residual
KEEPDUTY	+	-0.00049	-0.02756	-0.02773
KEEPPARAGRAPH	+	-0.00049	-0.02756	-0.02773
MCREPORT	+	0.011478	0.644724	0.646978
DEBATE	+	0.039673	2.294725**	2.238588**
HOUESEPASS	+	-0.01297	-0.72983	-0.73187
SENATEPASS	+	0.011056	0.622395	0.624677
SIGNED	+	-0.00804	-0.45115	-0.4533

*Significant at the 10% level.
**Significant at the 5% level.

[147] Robin A. Prager. "The Effects of Horizontal Mergers on Competition: The Case of the Northern Securities Company. (*The RAND Journal of Economics* Vol. 23 No. 1, Spring 1992), 127.

Tables 2 and 3 report the significance results for the residuals for the National Lead Trust and the American Sugar Refining Company. For the American Sugar Refining Company, the residuals for the events DEBTFOUND, LOBBY, NRRUMOR2, NRRULING, NEWJERSEY, MCREPORT, DEBATE, and SENATEPASS have expected signs, but only NRRUMOR2 is significant at the 5% level. NRRUMOR1, surprisingly, shows a positive and significant sign.

For the National Lead Trust, only MCREPORT, DEBATE, and SENATEPASS have expected signs, but DEBATE is significant at the 5% level. For the Lead Trust, perhaps, the unexpected victory in the passage of the McKinley Tariff Act came during debate in the House of Representatives. By the time the House actually voted on the bill, lead trust executives anticipated a positive outcome.

6.3 CONCLUSIONS

This event study demonstrates how both the Sugar Trust and the Lead trust derived excess returns from events related to the passage of the McKinley Tariff Act. Figures 1 and 2 show the cumulative abnormal returns for each company during the event window. Tables 2 and 3, however, show the standardized and studentized residuals for the regression, and from these results it appears that both companies largely anticipated that the bill would be passed.

7.0 CONCLUSION

When studying the Gilded Age in United States history, economists and historians have devoted significant but separate attention to the issues of tariff protection and industry consolidation. At the end of the nineteenth century, however, some economists and political parties believed that tariff protection, by shielding large consolidations from foreign competition, strengthened or encouraged powerful trusts. The Democratic Party believed that protective tariffs favored certain Eastern industrial interests like trusts and thus opposed tariff protection on democratic principle. Some economists believed that tariffs allowed trusts to raise prices to the detriment of the consumer.

The cases of the Sugar and Lead Trusts, however, show how industry leaders formed consolidations not because of tariff protection but instead out of a conscious desire to eliminate "ruinous" domestic competition. Consolidation agreements, not the tariff, were the mothers of trusts. Trusts, on the other hand, did benefit from tariff protection once their consolidations formed just like any domestic industry protected by such import duties. The McKinley Tariff Act changed the tariff schedule to benefit both the sugar and lead industries as a whole. Thus, event studies show that the sugar and lead industries derived some abnormal returns during the event window for events related to the passage of the McKinley Tariff Act.

The effect of these protective tariffs on producers overseas represents a promising avenue for future research. A study of how international competitors in the sugar and lead industries

reacted to changes in the American tariff schedule should provide direct historical evidence for how protective tariffs affected American industry consolidation. Meanwhile, the debate over tariff protection has reemerged as politicians demand greater protection for American industries in the current difficult economic climate.[148] It may, therefore, also be useful to study the effects of tariff protection on industrial organization using more contemporary examples or by construction of a model contrasting the effects of domestic and foreign competition for emerging monopolies.

A full exploration of the connection between tariffs and trusts during the nineteenth century required an interdisciplinary perspective. To understand why politicians, economists, and journalists linked tariffs and industry consolidation in the period, it was necessary to explore primary as well as secondary historical sources. Measuring the actual impact of protective tariffs on some of these industries, however, required formulating and testing hypotheses based in economic theory. Thus, methodology from both economics and history proved useful in this study.

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[148] Paul Krugman. "Protectionism and stimulus (wonkish)." *New York Times.* February 1, 2009.

APPENDIX A

COMPANIES IN THE 12 STOCK AVERAGE MARKET PORTFOLIO

Chic. Milwaukee & St. Paul

Chicago North Western

Delaware & Hudson Canal

Del., Lackawanna & Wanna

Lake Shore Railroad

Louisville & Nashville

Missouri Pacific

Northern Pacific pfd

New York Central

Union Pacific

Pacific Mail Steamship

Western Union

Source: Pierce S. Phyllis, Ed. *The Dow Jones Averages: 1885-1985: Centennial Edition.* Homewood, IL: Dow Jones-Irwin, 1986.

APPENDIX B

MARKET SHARE OF THE AMERICAN SUGAR REFINING COMPANY

Table 4: ASRC Market Share

Date	Market Share
1890	67.7
1891	65.2
1892	91.0
1893	85.7
1894	77.0
1895	76.6
1896	77.0

Source: David Genesove and Wallace P. Mullian. "Testing Static Oligopoly Models: Conduct and Cost in the Sugar Industry, 1890-1914." *The RAND Journal of Economics.* Vol. 29 No. 2, 1998, 368.

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