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The Economic Effects of the Montgomery Bus Boycott

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The Economic Effects of the Montgomery Bus Boycott

Abstract

While the Montgomery Bus Boycott is widely celebrated, its economic impact on Montgomery has been understudied. This paper reexamines the Montgomery Bus Boycott with two goals: 1. Determining if the Montgomery Bus Boycott affected the city's public finances. 2. Forecasting the probability that city revenues would have fallen below expenditure. Our analysis demonstrates that the Boycott had a negative effect on the city's public finances, particularly in the area of policing and fire services, driven by the city's "get tough" policy response to the boycott. Using historical financial records and time-series forecasting (ARIMA), this paper quantifies the growing fiscal strain experienced by the city. Although Montgomery maintained budget surpluses during the Boycott period, projections indicate a rising probability of deficits had the protest continued. These findings highlight the economic leverage wielded by organized civil resistance and puts into focus the material costs municipal governments incur when confronting social movements.

*

On December 1, 1955, Rosa Parks boarded a Cleveland Avenue bus in downtown Montgomery, Alabama, after a long day's work. Shortly after taking her seat, Mrs. Parks was approached by the bus operator, who asked her to move to the back of the bus because the seat she was in was reserved for white passengers. Mrs. Parks refused to move (King, 1958) and thus violated the City of Montgomery's segregation laws (Tatham, 2020). Mrs. Parks was arrested and charged with violation of Chapter 6, Section 11, of the Montgomery City Code (Tatham, 2020). This event was the first in a series that would come to be known as The Montgomery Bus Boycott.

In recent times, the historical account of the civil rights movement has come to be represented as the story of a clash between right and wrong, good and evil, the just against the unjust. Historians paint the picture of the righteous Rev. Dr. Martin Luther King, Jr. and the

Christian Church in a pitched battle against the Southern segregationist movement led by figures such as Alabama Governor George Wallace and Birmingham's Sheriff Bull Connor. In this picture, we see Gandhian nonviolence triumphing amid water hoses, police violence, and mob action. While there is a wealth of narrative evidence presenting civil rights victories as moral victories for America, there is very little work on the economic pressures the civil rights movement created. This paper reexamines the Montgomery Bus Boycott with two goals: 1. Determining if the Montgomery Bus Boycott affected the City of Montgomery's public finances. 2. Forecasting the probability that city revenues would have fallen below expenditures.

Historically, the Montgomery, Alabama, economy has been driven by two major industries: agriculture and the military. In the 1950s, Montgomery was one of the "largest cattle markets east of Fort Worth, Texas, and south of the Ohio River, marketing approximately \$30 million worth of cattle annually" (King, 1958). The city was also "a prominent market for cotton, livestock, yellow pine, and hardwood lumber, and is one of the nation's important centers for the manufacture of commercial fertilizer" (King, 1958).

In addition, Montgomery was home to both Maxwell and Gunter Air Force Bases. The Montgomery Chamber of Commerce estimated that in 1955 these two military bases generated \$55 million in economic activity (King, 1958). "One in every fourteen employed civilians in Montgomery worked at these bases, and approximately one in every seven families was an air force family, either civilian or military" (King, 1958). Although the bases were integrated workplaces, off the bases, the lives of Montgomery residents were completely and thoroughly segregated.

Montgomery's racial disparities were deep and vast. In terms of income, the disparity was evident wherever one looked. From 1950 to 1960, the income gap in Montgomery grew

from 44% in 1950 (King, 1958) to 56% in 1960 (US Census, 1961) when the median income for a black family in Montgomery was less than half that of the median family income for a white family in the city¹ (U.S. Census, 1961). This income disparity was correlated, in part, with the fact that 63% of black female citizens and 48% of black male citizens of Montgomery were employed as laborers or domestic workers (King, 1958).

However, the disparities and inequities for Montgomery residents did not stop there. U.S. Census data shows that the median value for a nonwhite Montgomery resident's home was less than half the median value of all homes in the city of Montgomery.² (1961). One reason for this disparity could be that 65% of homes occupied by nonwhite Montgomery residents were 20 years old or older. Also, homes occupied by nonwhite Montgomery residents had, on average, 3.7 rooms, compared with the 4.8 rooms in the median home for all Montgomery families. Furthermore, 53% of the homes occupied by nonwhite residents were identified by the US Census Bureau as having a deteriorating or dilapidated plumbing system (1961).

Black Montgomery residents living in rented homes also faced negative disparities in rent pricing. Although the median home value for nonwhite residents of Montgomery was 51% of the average home value, the median rent for a nonwhite resident of Montgomery was 38% below the median rent paid by Montgomery residents.³ (US Census, 1961). This means that, on average, nonwhite citizens of Montgomery were paying more for housing but receiving less for their money than their white counterparts.

¹ In 1960, the median income for a nonwhite Montgomery family was \$2,349—compared with the median income for a white family of \$5,065 (US Census, 1961).

² In 1960, the median home value for a nonwhite family in Montgomery was \$5,800—compared with the median home value for a white family of \$11,800 (US Census, 1961).

³ In 1960, the median rent for nonwhite residents of Montgomery was \$34.00 per month—compared with \$55.00 for the total population (US Census, 1961).

In addition, the Montgomery school system was thoroughly segregated. Prior to the Montgomery Bus Boycott, no school, kindergarten through college, was integrated. Despite this, a noteworthy 10% of the nonwhite Montgomery residents had attended college (US Census, 1961), due in part to the presence of Alabama State College, an all-black college (or HBCU) in the city. However, even with this notable achievement under the circumstances, the median number of school years completed by nonwhite Alabama residents at the time was 7.6 years (US Census, 1961). Limits on the years of education attained by nonwhites in Montgomery no doubt play an important role in the fact that less than 7% of voting-age black Montgomery citizens were registered to vote⁴ (King, 1958).

Despite these substantial barriers and limitations, the average nonwhite Montgomery resident lived in a traditional family household. A total of 57% of the marital-aged nonwhite residents of Montgomery⁵ Were married and 58% of nonwhite residents under the age of 18 lived in a two-parent household.⁶ The nonwhite population of Montgomery was young, with the median age for males at 21 and for females at 25. Residents of the nonwhite part of the community were much younger than those in the white Montgomery community, where the median age for males was 27 and for females was 29 (US Census, 1961). Even though the people in these two separate communities lived out their lives in very distinct worlds, on December 1, 1955, both of these worlds would come together in the history books.

After Rosa Parks was arrested, a prominent leader in the black community, E.D. Nixon, posted bond for Mrs. Parks and then, as a follow-up, invited community leaders to meet to

⁴ Alabama at that time administered a literacy test to voters in order to establish who would be eligible to register to vote—and, ultimately, who would not be allowed to vote.

In Alabama, ⁵ Marital age was defined as 14 years old.

⁶ This is an exceptionally high number because one could marry at the age of 14. As a result, many over the age of 14 had the option to leave the household if they chose to.

consider what to do in response. These community leaders, meeting to discuss the situation, decided to call for a one-day bus boycott scheduled for Monday, December 5, 1955. Flyers were created, and a boycott-related article was published in the local Montgomery paper, the *Montgomery Advertiser*, on Sunday, December 4, 1955 (McGhee-Hilt, 2015). On Monday, December 5, the bus company reported an over 90% drop in bus ridership. On that afternoon, at the Holt Street Baptist Church, a large number of Montgomery citizens met, and an organization, the Montgomery Improvement Association (MIA), was formed to coordinate and lead the ongoing bus boycott. Dr. Martin Luther King, Jr. was elected President of this new organization, and members agreed to continue the boycott indefinitely in Montgomery (King, 1958).

On December 8, 1955, negotiations began among the MIA, the Montgomery city commissioners, and city bus officials. The MIA presented the following three demands: “1. Courteous treatment by the bus operator [would be] guaranteed; 2. Passengers [would be] seated on a first-come, first-served basis—Negroes seating from the back of the bus toward the front while whites [would be] seated from the front toward the back; 3. Negro bus operators [would be] employed on predominantly Negro routes.” Since the three parties could not agree, negotiations were halted on December 19th (King, 1958). What is evident, however, is that even at this early stage, the bus company was already feeling financial pressure.

On December 21, 1955, J.H. Bagley, head of the Montgomery bus company,⁷ wrote a letter to the City Commission requesting that all fares be temporarily doubled until “conditions warrant” a return to the original pricing structure (City of Montgomery Board of Commissioners, 1956). By this time, the bus company was losing between 30,000 and 40,000 fares per day with corresponding revenue losses of \$3,000 to \$4,000 per day (National Park Service, 2016).

⁷ Montgomery City Lines was, at the time, the name of the Montgomery bus company.

Adjusted for inflation, the bus company was losing \$31,710 to \$42,280 of revenue per day, \$951,300 to \$1,268,400 per month, and what would amount to between \$11,415,600 and \$15,220,800 annually. By the end of the month, the bus company would lose 60.62%⁸ of its revenue when compared to December 1954 (Montgomery City Lines, 1955).

In addition, as boycotters chose not to use public bus transportation, the Montgomery business community began to see a drop in store patronage. Since the start of the protest, downtown businesses have been losing as much as a third of their sales compared with pre-boycott levels (Reddick, 1956). Rev. B.J. Simms, one of the boycott leaders, remarked in an interview, “The businessmen were mad with the politicians because downtown was just dying” (Garrow, 1989). To further exacerbate the business community's economic woes, boycotters took pride in not participating in that year's Christmas buying season. This action was seen as a show of solidarity in the boycott (Garrow, 1989).

Along with the revenues, the City of Montgomery was set to lose from the decline in business activity; the city also stood to lose a portion of its \$20,000 in yearly tax revenue collected from Montgomery City Lines (Reddick, 1956). On January 4, 1956, the City Commission called a special meeting to meet with Bagley to discuss the situation. The commissioners agreed with the bus company's assessment of the economic environment but approved only a 50% fare increase, effective January 9, 1956 (City of Montgomery Board of Commissioners, 1956). This meant that white Montgomery residents who continued to ride the buses were paying increased fares to compensate the bus company for boycott-related losses. These increased fares essentially amounted to a discrimination tax that white bus riders who

⁸ This equates to a \$53,840 loss in December 1955 when compared to the company's December 1954 numbers.

continued to ride the buses would be forced to pay in order to continue to ride on segregated buses.

Given that the Montgomery bus system was facing a financial crisis, on January 23, 1956, Mayor W.A. Gayle announced what he called a “get tough” policy designed to break the boycott. In a speech, Mayor Gayle declared he would “stop pussyfooting around with the boycott.” He went on to emphasize that, in his view, “The vast majority of white Montgomerians ... [do] not care if a Negro ever rode the buses again” (King, 1958).

The mayor’s “get tough” strategy was designed around four distinct and intentional elements: First, he pledged to increase police presence around buses, ensuring passengers who wanted to ride could do so freely and safely. Second, he called on the police to crack down on the boycotters. Third, to reinforce the second “crack down” goal, Mayor Gayle called upon white employers to stop driving Negro employees to and from work; he put police pressure on residents who carpooled; and he instructed police to harass and arrest protest leaders. Finally, to go even further on the offensive, Mayor Gayle took the appropriate steps to officially register not only himself but also the entire leadership of the City Commission in the “White Citizens Council,” a racist organization created to promote and maintain white supremacy (King, 1958).

In financial terms, as well as in other ways, Mayor Gayle’s “get tough” policy was a significant turning point for the city of Montgomery. The “get tough” policy towards the protestors initiated a vicious cycle that operated as follows: The city leaders’ stance emboldened their supporters to target protestors with violence. That violence created a need for enhanced protective measures by police and fire departments in the community, increasing the amount of money needed to be spent on public services. Meanwhile, the violent reaction of the counterprotestors hardened the boycotters' resolve to continue advancing their cause, which, in

turn, forced the city's political leaders to maintain their "get tough" policy, thus feeding an ongoing vicious cycle.

Mayor Gayle's decision to ramp up the police presence during the boycott increased expenditures and put downward pressure on the city budget. Also, in addition to adding to the city's already stretched budget, the mayor's aggressive, outspoken position emboldened members of the public opposed to the boycott to express their views through violence. Between January 30, 1955, and early 1957, several homes and churches were bombed—including even Dr. King's home. In his book *Stride To Freedom*, Dr. King linked the violence in Montgomery directly to the mayor's policies, writing of the moment on the night of January 30, 1956, when his home was firebombed. One of Dr. King's trustees turned to the mayor and Commissioner Sellers.⁹ Moreover, said the following: "You may express your regrets, but you must face the fact that your public statements created the atmosphere for this bombing. This is the result of your 'get-tough' policy" (King, 1958).

The number of boycott-related bombings meant an increase in the use of police and firefighters throughout the city. From the end of the 1955 fiscal year to the end of the fiscal year in 1956, the City of Montgomery increased its expenditures for the police by 10% (\$56,404.25) from \$569,479.24 to \$625,883.49. More astonishing is that fire department expenditures increased by 33% (\$189,822.34) from \$571,569.31 to \$761,391.65 (City of Montgomery, Alabama, & Aldridge, Borden, and Jones Certified Public Accountants, 1955). Despite the onerous fiscal burden it had to bear at the time, the city of Montgomery administration continued its 'get tough' policies, costing the city thousands in taxpayer dollars.

⁹ Commissioner Sellers was head of the police department in Montgomery.

On February 1, 1956, Attorney Fred Gray, Sr. filed a lawsuit in the United States District Court in Montgomery on behalf of five women who alleged they had experienced racial discrimination on the city buses. The case would be identified as *Browder v. Gayle*, and it charged that the city commissioners, the city police chief, the bus company, and two bus drivers conspired “to interfere with the civil and constitutional rights of the Negro citizens of Montgomery” (Gilliam, 1989). The lawsuit asserted that those involved with the alleged conspiracy also used “force, threats, violence, intimidation, and harassment” to stop the citizens of Montgomery from “using private transportation, therefore depriving them of the rights, privileges, and immunities guaranteed by the Fourteenth Amendment of the United States Constitution” (Gilliam, 1989). It went further to claim that the city commissioners used five specific tactics to harm the plaintiffs: “First, they had urged whites to refuse transportation to Negro employees. Also, the commissioners had joined the White Citizens' Council. Defendants had also enforced traffic regulations too stringently against Negroes, while not doing the same to whites. The police had questioned and harassed Negro taxi drivers. Finally, defendants had promoted economic reprisals against Negroes in various ways, such as giving information on boycotters to their employers” (Gilliam, 1989).

The plaintiffs asked the federal court to stop the defendants from “conducting such interference in the future” (Gilliam, 1989). They also asked the court to “define the legal rights of all parties involved, and brand the interference cited above as a violation of the Fourteenth Amendment” (Gilliam, 1989). Lastly, the plaintiffs asked the court to rule “that the sections of the Montgomery City Code and the Code of Alabama about segregation on intra-state buses be ‘null and void’” (Gilliam, 1989).

On June 5, 1956, the US District Court ruled in favor of the plaintiffs and held that the Montgomery City Code and the Code of Alabama about segregation on intra-state buses were henceforth null and void (Gilliam, 1989). On November 13, 1956, the US Supreme Court upheld the district court ruling in *Browder v. Gayle*, striking the final blow to legalized bus segregation laws. As a result, the city of Montgomery desegregated its buses on December 21, 1956 (“Four Negro churches bombed in Alabama,” 1957).

However, this groundbreaking court verdict, despite its far-reaching influence, did not stop the violence. On the dawn of January 10, 1957, four churches and the homes of two ministers were bombed in Montgomery (“Four Negro churches bombed in Alabama,” 1957). In response, the City Commission suspended bus service, fearing the violence would continue. On January 29, 1957, it put up a \$2,000 reward for “information leading to the arrest and conviction of a person or persons involved in the ... bombings.” As a follow-up, the Montgomery City Commission members wrote in their resolution the following words: “there has been a resumption of bombings in the city of Montgomery threatening the lives and property of our citizens” (City of Montgomery Board of Commissioners, 1957). Judging from the commissioners’ public statements, as well as their membership in the White Citizens Council, the word “citizen” here was clearly meant to promote on an exclusive basis the protection of the property and lives of the white citizens of Montgomery, Alabama, and did not apply to nonwhite citizens.

By the end of 1956, the Montgomery Bus Boycott had cost the Montgomery City Lines \$715,197.00 in revenue when compared to 1955. This is a 68% revenue shortfall (Montgomery City Lines, 1956). Shortly after the end of the Montgomery Bus Boycott, J.H. Bagley submitted a petition to the Montgomery City Commission requesting an expansion of the city's bus service

(City of Montgomery Board of Commissioners, 1957). This indicates that, with the end of the Montgomery Bus Boycott, ridership on the now-integrated buses began to grow.

Looking at all the available evidence, it is clear that both Montgomery city officials and prominent business leaders were aware that the bus boycott was negatively affecting the city's finances. The historical record shows that during the Montgomery Bus Boycott, the city of Montgomery faced two pressures on its operating budget: first, rising operating expenditures, and second, declining operating revenue. Figure 1: The City of Montgomery's total operating revenue and expenditures from 1948 to 1959 illustrate the city leaders' concerns.

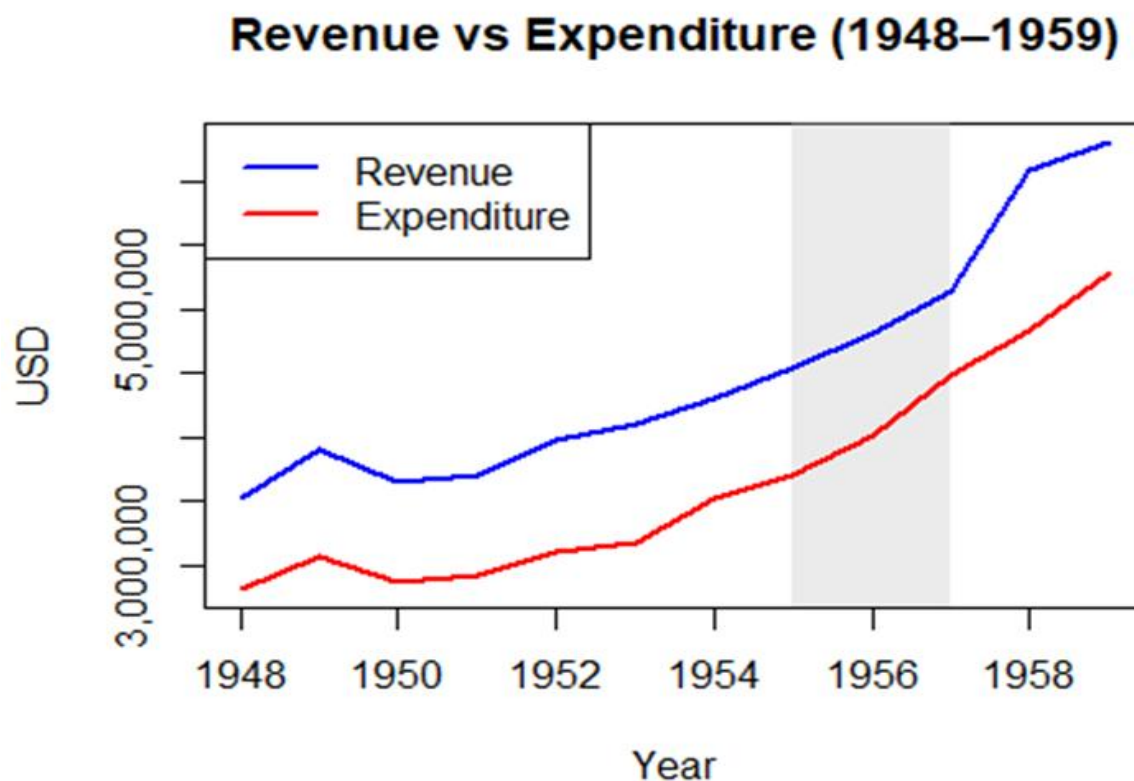


Figure 1: Revenue vs Expenditure (1948-1959)

The data demonstrate a roughly parallel trend in both categories, indicating that the city's budgeting aligned primarily with revenue fluctuations before 1955. However, during the boycott

years (indicated by vertical lines in 1955 and 1957), expenditure growth accelerated faster than revenue growth. Table 1 presents the raw data, which shows that revenue began to decelerate during the boycott period 1955 - 1956 (6% and 7%, respectively), while city expenditures accelerated (8% and 12%, respectively).

Table 1: City of Montgomery Actual Total Operating Revenues vs. Actual Total Operating Expenditures						
Year	Total Revenue	Actual Change	Total Expenditures	Forecasted Change	Budget Surplus	Surplus Percentage
1948	\$ 3,527,296.13		\$ 2,820,452.86		\$ 706,843.27	20%
1949	\$ 3,901,835.63	11%	\$ 3,079,046.51	9%	\$ 822,789.12	21%
1950	\$ 3,657,010.99	-6%	\$ 2,872,390.33	-7%	\$ 784,620.66	21%
1951	\$ 3,714,332.58	2%	\$ 2,919,893.87	2%	\$ 794,438.71	21%
1952	\$ 3,972,194.42	7%	\$ 3,100,412.24	6%	\$ 871,782.18	22%
1953	\$ 4,099,004.69	3%	\$ 3,182,788.30	3%	\$ 916,216.39	22%
1954	\$ 4,310,919.24	5%	\$ 3,518,268.39	11%	\$ 792,650.85	18%
1955	\$ 4,545,681.36	5%	\$ 3,701,773.39	5%	\$ 843,907.97	19%
1956	\$ 4,812,574.12	6%	\$ 4,008,860.91	8%	\$ 803,713.21	17%
1957	\$ 5,132,026.10	7%	\$ 4,495,431.81	12%	\$ 636,594.29	12%
1958	\$ 6,074,244.60	18%	\$ 4,836,070.09	8%	\$ 1,238,174.51	20%
1959	\$ 6,301,765.72	4%	\$ 5,288,301.65	9%	\$ 1,013,464.07	16%
Total	\$ 54,048,885.58		\$ 43,823,690.35		\$ 2,888,232.87	7%

This event would contract the budget surplus, as shown by the fact that October 1, 1956 – September 30, 1957, was the lowest percentage of budget surplus during the period (12%). This data shows that the city experienced both unprecedented declines in revenue and rising expenditures during the Montgomery Bus Boycott.

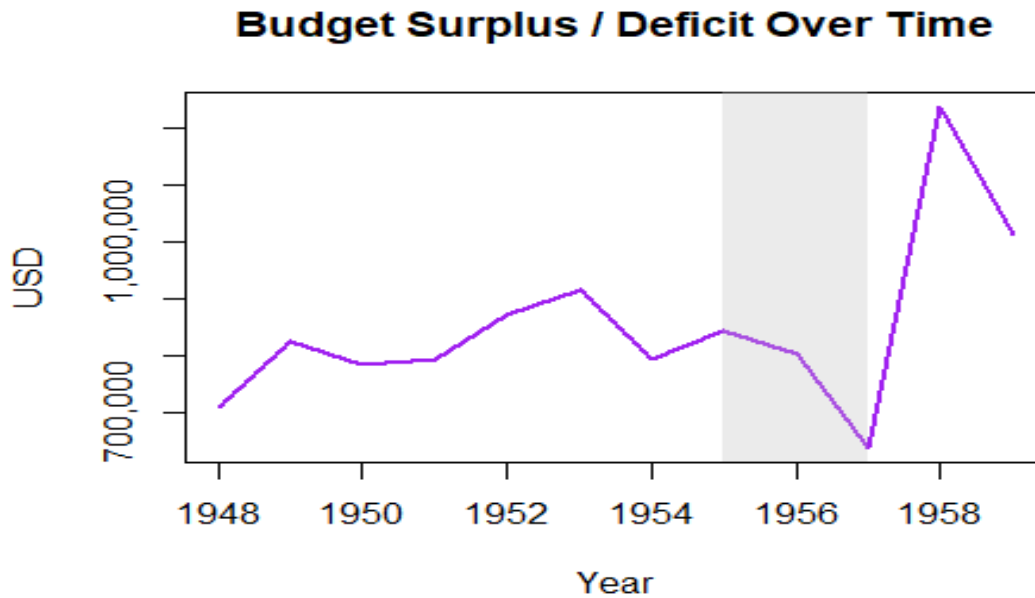


Figure 2: Budget Surplus/Deficit Over Time

Figure 2 illustrates the net budget balance (Revenue minus Expenditure) from 1948 to 1959. The city's surplus trend declines significantly during the boycott years, reaching its nadir from October 1, 1955, to September 30, 1957. This downturn corresponds with the peak fiscal pressure exerted by the boycott. The timing and shape of the curve suggest that, although the city managed to maintain a surplus during the boycott, the boycott significantly constrained fiscal margins.

Table 2: Pre- vs Post-Boycott Fiscal Averages and Percent Change

Metric	Pre_Boycott	Post_Boycott	Percent_Change
Average Revenue	\$3,883,227.7	\$5,373,258.4	38.37%
Average Expenditure	\$3,070,464.6	\$4,466,087.6	45.45%
Average Public Protection	\$966,019.4	\$1,578,603.6	63.41%
Average Budget Balance	\$812,763.0	\$907,170.8	11.62%

Table 2 presents a comparative analysis of average fiscal indicators for the pre-boycott period (1948–1954) and the post-boycott period (1955–1959).

Revenue increased by 38.37%, whereas expenditures rose by 45.45%. The budget balance increased modestly by 11.62%, suggesting that although the city technically maintained a surplus, its financial buffer was diminishing.

This evidence leads to the study’s first question: Did the Montgomery Bus Boycott affect the City of Montgomery’s public finances? This paper will answer that question by responding to two more basic questions. The first question: what was driving the rise in the city’s total operating expenditures? The second question: Is there evidence that the city’s “get tough” campaign against the boycott led to an increase in total operating expenditures? To answer these questions, a department-by-department comparison of the city of Montgomery’s operating expenditures before and after the boycott will be needed. This will show what department was driving the city’s total operating expenditures.

Figure 3 shows the six largest departments in the city of Montgomery from 1948 to 1959 in terms of expenditures. This provides a visual representation of how much more the city of Montgomery was spending on the fire and police departments—and how quickly expenditures for these departments were growing relative to those for the other departments. In 1955, these six departments accounted for approximately 60% of Montgomery’s total operating expense budget (City of Montgomery, Alabama, & Aldridge, Borden, and Jones Certified Public Accountants, 1955). For the fiscal year ending September 30, 1955, prior to the boycott, 30% of the city of Montgomery’s operating expenditures (\$1,141,048.55) was spent on “public protection services” to include the police department (15%: \$569,479.24) and the fire department

(15%: \$571,569.31) (City of Montgomery, Alabama & Aldridge, Borden, and Jones Certified Public Accountants, 1955). The following year, during the boycott, “public protection service”

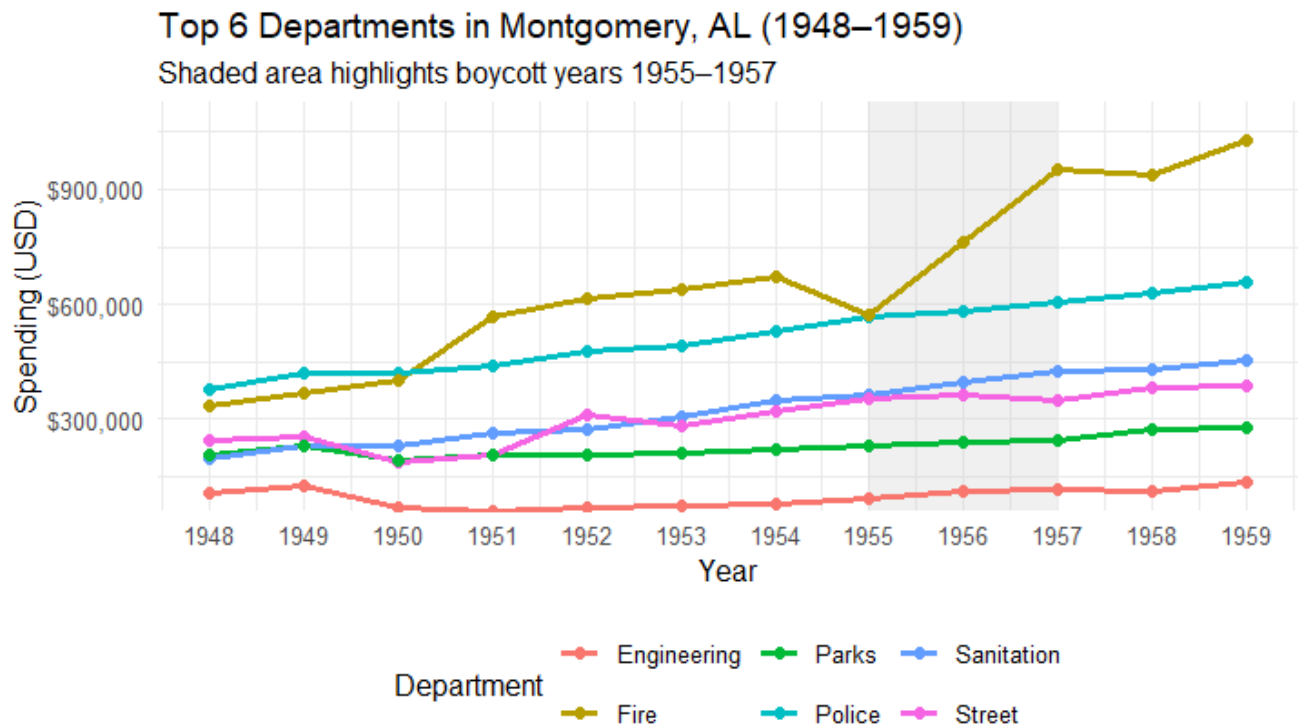


Figure 3: Top 6 Departments in Montgomery, AL (1948–1959)

Expenditures rose by more than 21% (\$246,226.59), accounting for 35% of the city of Montgomery’s total operating expenditures (City of Montgomery, Alabama, 1956). When focusing on the increase in city expenditures between fiscal year 1955 and fiscal year 1956, city operating costs rose by \$307,087.52 (8%) from \$3,701,773.39 in 1955 to \$4,008,860.91 in 1956. This means 18% (\$56,404.25) of the \$307,087.52 increase in city operating expenditures was represented by increased police spending. Also, 62% of the city’s increase in operating expenditures, \$189,822.34, was due to added funding for the fire department. As a result, 80% of the city’s increase in its operating budget between fiscal year 1955 and fiscal year 1956 is due to

increases in the city's spending on police and fire services (City of Montgomery, Alabama & Aldridge, Borden, and Jones Certified Public Accountants, 1956).

Expenditure on fire and police departments registered the most substantial growth at 63.41%, signifying the city's heightened reliance on policing and fire services.

To put the gap between the fire and police departments and the other departments, let us use an example. The gap between expenditures for the largest department, the fire department, and those for the smallest department, the engineering department, was \$267,699.00 in 1948 (City of Montgomery, Alabama, 1948). By 1955, seven years later, that differential in expenditures between the fire department and the engineering department had almost doubled to \$476,940.00 (City of Montgomery, Alabama & Aldridge, Borden, and Jones Certified Public Accountants, 1955). However, in a little more than half of the time—the four years ending in 1959—the gap between the fire department and the engineering department had more than tripled to \$886,647.00 in 11 years (City of Montgomery, Alabama, 1959). It is important to note that 1955 – 1957 were the years during which the Montgomery Bus Boycott took place.

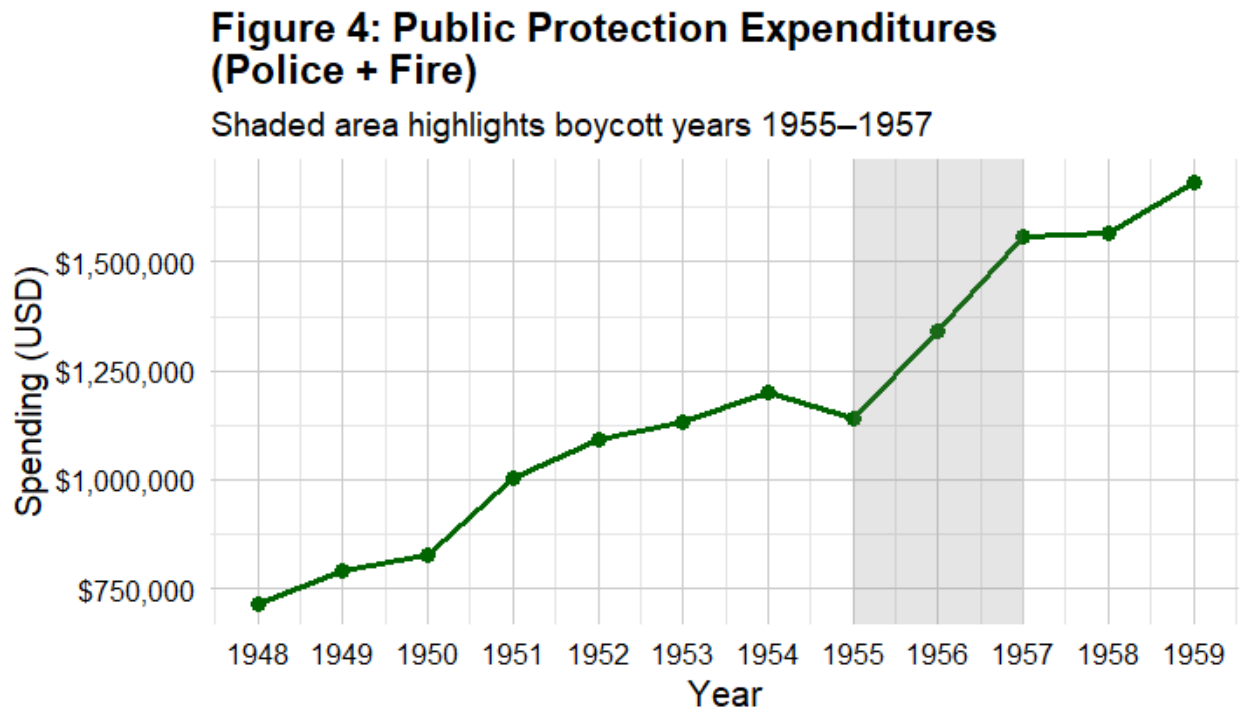


Figure 4 shows that total expenditures for public protection services (police + fire) increased in 1956, the same year the city of Montgomery began its “get tough” campaign.

Finally, to highlight the correlation between the City of Montgomery’s total operating expenditures and the increase in the need for public protection services, a regression analysis has been conducted. Table 3 indicates a positive correlation between total operating expenditures and the increase in the expenditure for public protection services. The R-squared is saying protection services explain 92.87% of the variance in total operating expenditures. Furthermore, the p-value is .000004674, so we reject the null. This data provides compelling evidence of a significant relationship between funding expended for public protection services and the city’s total operating expenditures. The correlation between the City of Montgomery’s total operating expenditures and the expenditure for public protection services is statistically significant. This is compelling evidence that the police and fire departments were driving the rise in the city’s total operating expenditures.

Table 3: Regression Analysis

Call:

```
lm(formula = Total_Operating_Expenditures ~ Public_Protection_Services,  
    data = df)
```

Residuals:

```
    Min      1Q  Median      3Q     Max  
-290087 -186621  24286  209534  309594
```

Coefficients:

```
              Estimate Std. Error t value Pr(>|t|)  
(Intercept)    1.149e+06  2.294e+05   5.01 0.000529 ***  
Public_Protection_Services 2.049e+00  1.796e-01  11.41 4.67e-07 ***
```

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 233200 on 10 degrees of freedom

Multiple R-squared: 0.9287, Adjusted R-squared: 0.9216

F-statistic: 130.3 on 1 and 10 DF, p-value: 4.674e-07

The second question addressed in this study is whether the city's "get tough" campaign against the boycott led to an increase in total operating expenditures. To this point, the evidence shows that the majority of the increase in the city's expenditures can be explained by police and fire department spending. Is there evidence that the rise in police and fire department spending resulted from the city's "get tough" campaign? Here, it is worth noting again the cycle that the Montgomery political leaders' "get tough" campaign put on the city's public financing. The "get tough" policy towards the protestors initiated a vicious cycle that operated as follows: The city leaders' stance emboldened their supporters to target protestors with violence that resulted in the need for enhanced police and fire department-related protective measures in the community, increasing the dollar amount needed to be spent for enhanced public services needs in the community. Meanwhile, this violence hardened the resolve of the protestors to continue advancing their cause, which, in turn, forced the city's political leaders to continue their "get

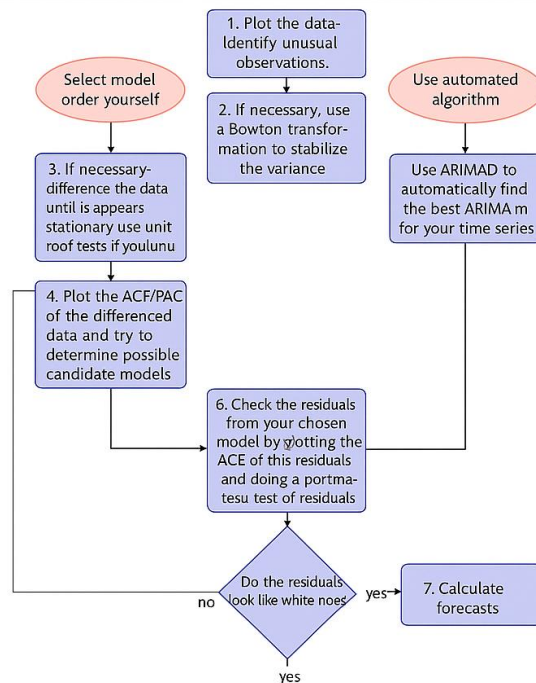
tough” policy, thus playing into and feeding an ongoing vicious cycle. The data support this increase in expenditures.

The historical narrative supports the data concerning this theory. When the city leaders decided on their “get tough” policy, one of the things they did was publicly join the White Citizens Council. This action empowered like-minded individuals also to take a strong stance against the boycotters. The stronger the resistance to the boycott was, the more defiant the boycotters became in the face of violence. The more defiant the boycotters became, the more the city leaders leaned into their “get tough” policy. Moreover, the cycle continued to produce more negative outcomes. For example, there were at least ten reported bombings of homes and churches in the 1956 to 1957 period. The majority of these structures were brick, and the fire department was forced to let them burn rather than put out the fire quickly. This increased the time the fire department spent at the event, leading to higher payroll expenditures due to overtime costs (Garrow, 1989). As a result, the increase in bombing activity was a driver of increased fire department expenditures.

As for the police department, there are several reasons its expenditures increased under the city’s “Get Tough” policy. One in particular is that Mayor Gayle required two police cars to follow every bus on any given day for the duration of the boycott to ensure the buses' safety and security. Another is Mayor Gayle increasing patrols throughout the city of Montgomery during the boycotts and encouraging patrolmen to pull over cars that appeared to be involved in carpooling boycotters (King, 1958). As a result of these decisions by city leaders during the boycott, police department overtime costs increased, driving budget growth.

Now we will focus on the second question: Forecasting the probability that city revenues would have fallen below expenditure. This paper will use the traditional modeling procedure for ARIMA models to produce forecasts (Hyndman & Athanasopoulos, 2018).

Modelling procedure

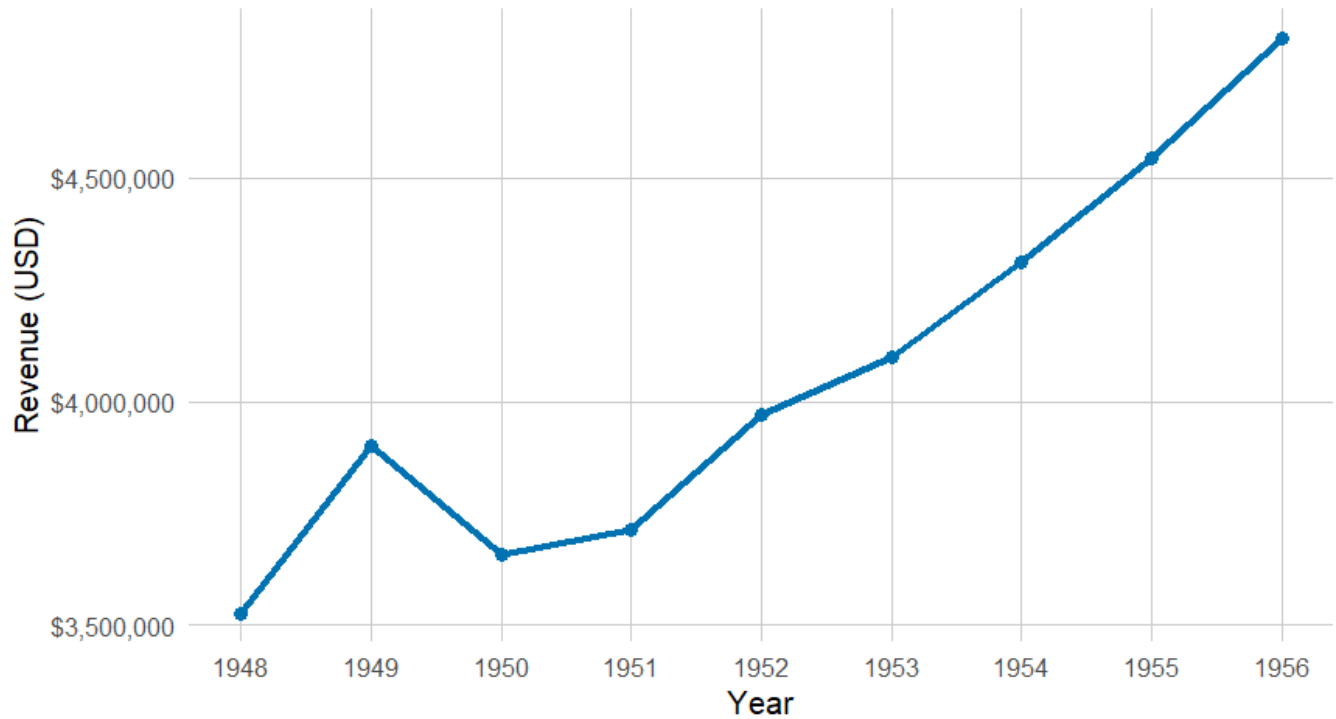


4

Figure 5: Flowchart for the Traditional Modeling Procedure for ARIMA Models (Hyndman & Athanasopoulos, 2018)

To begin, revenue and expenditure will be plotted separately in order to identify any unusual observations. Figure 6 shows the total revenue for the City of Montgomery. The data is showing an upward trend. There are no unusual observations in the data, and the data is nonseasonal.

**Figure 6: City of Montgomery Total Revenue
1948–1956**



In the next step, we used ARIMA to select a model automatically. The model that was selected was an ARIMA (0,1,0) with drift, Figure 7. To assess the validity of the fitted ARIMA(0,1,0) with drift model used in forecasting municipal revenue, a residual diagnostic plot was generated. This figure presents three key components: time-series residuals, residual autocorrelation, and their distribution. In the first graph, residuals over time generally hover near the zero line. The sharp dip in 1950 and the high positive value in 1952 indicate potential outliers or years with revenue fluctuations not well captured by the model. However, overall, the residuals appear reasonably centered. All of the ACF spikes are within the critical values, indicating that no significant autocorrelation is observed in the residuals. This indicates that the residuals appear to have white noise, supporting the assumption that the ARIMA model has effectively captured the time-dependent structure in the data. Looking at the histogram, the residuals appear roughly normally distributed, though there is some skewness and one large

negative residual. Nonetheless, the histogram is close to a bell curve, which is acceptable for time-series residuals and suggests no significant violations of normality.

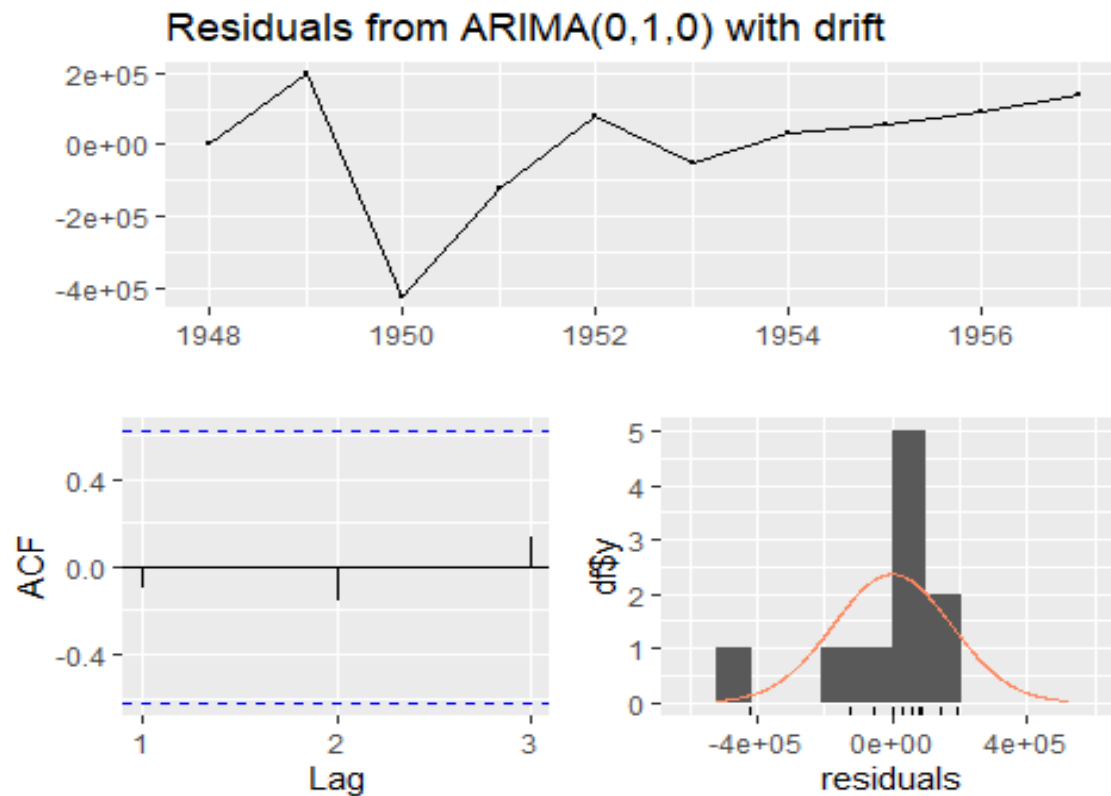


Figure 7: Residuals from ARIMA(0,1,0) with drift

As a result, the diagnostic results support the appropriateness of the ARIMA(0,1,0) with drift model for modeling and forecasting the time series of city revenue data. There are no signs of autocorrelation in the residuals, and the residuals are approximately normally distributed. Although a few years exhibit large deviations, they do not appear to undermine the model's overall validity.

To evaluate the independence of residuals from the ARIMA(0,1,0) with drift model, a Ljung-Box test was conducted using three lags (Figure 8). The null hypothesis is that the residuals are independently distributed; that is, there is no significant autocorrelation. Since the p-value =

Figure 7: Ljung-Box test

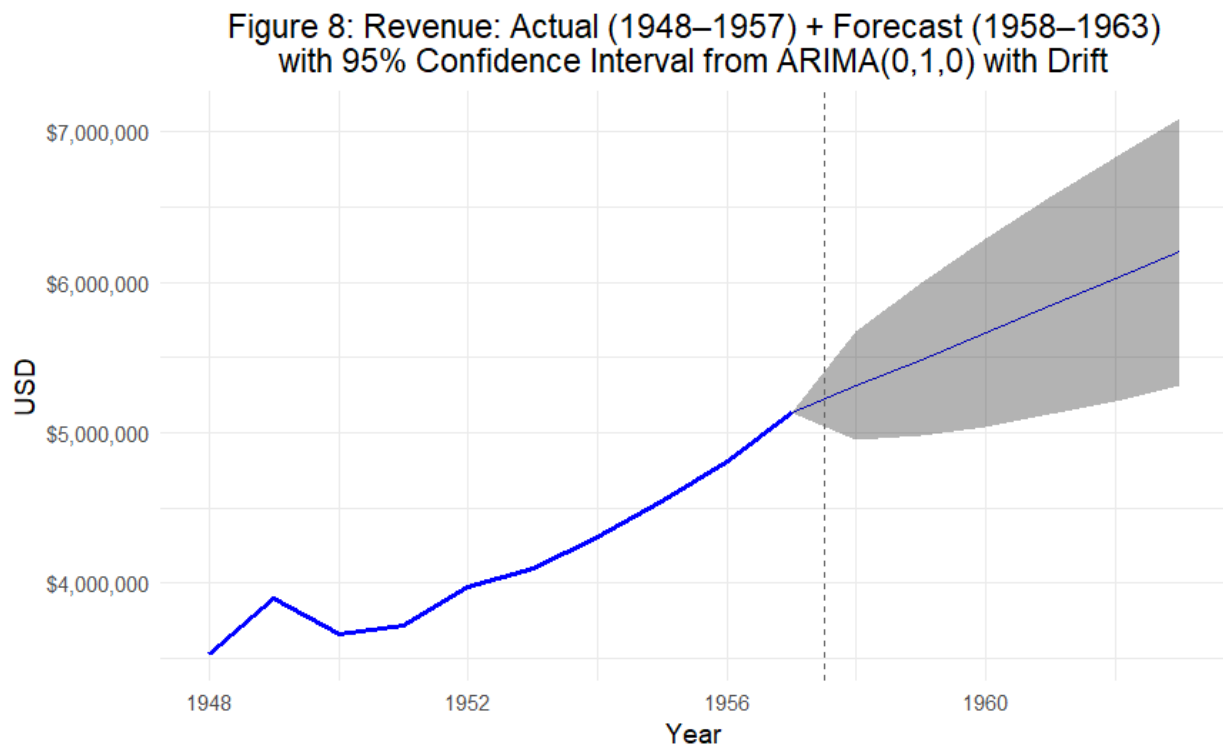
data: Residuals from ARIMA(0,1,0) with drift

$Q^* = 0.20251$, $df = 3$, $p\text{-value} = 0.9772$

Model df: 0. Total lags used: 3

0.8478, which is much higher than the conventional thresholds, we fail to reject the null hypothesis. This means there is no statistically significant autocorrelation in the residuals. The residuals from the ARIMA (0,1,0) model appear to be white noise, satisfying one of the key assumptions for a well-specified time series model. This evidence provides additional confidence that the ARIMA (0,1,0) with drift model adequately captures the temporal dynamics of the data and is therefore appropriate for forecasting and interpretation.

Using an ARIMA(0,1,0) model with drift, Figure 8 presents a time series analysis of total municipal revenue for the City of Montgomery from 1948 to 1957, alongside a forecast for the



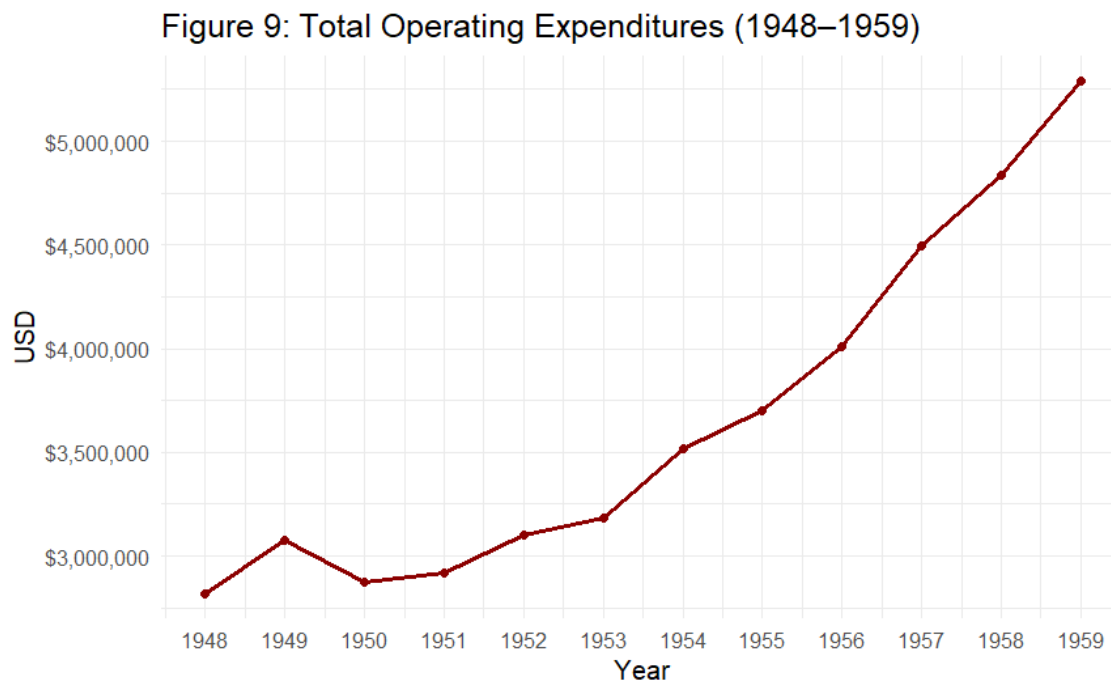
The subsequent six years (1958–1963). The shaded area around the forecast line represents the 95% confidence interval, indicating the range within which the actual revenue is expected to fall with high probability. As expected, the interval widens over time, reflecting increasing uncertainty the further we project into the future.

The table below presents the point forecasts and their associated 95% confidence intervals. For example, the forecasted revenue for 1958 is \$5.31 million, with a lower bound of \$4.95 million and an upper bound of \$5.67 million. By 1962, revenue is forecasted to reach over \$6.02 million, continuing the trend of annual increases.

Table 3: City of Montgomery Revenue Forecast Table (1958 – 1962)

Year	Forecast	Lower 95	Upper 95
1958	\$5,310,329.43	\$4,948,091.75	\$5,672,567.11
1959	\$5,488,632.76	\$4,976,351.32	\$6,000,914.20
1960	\$5,666,936.09	\$5,039,522.02	\$6,294,350.16
1961	\$5,845,239.42	\$5,120,764.06	\$6,569,714.78
1962	\$6,023,542.75	\$5,213,554.67	\$6,833,530.83

Now, Figure 9 presents a plot of total expenditures. This plot reveals no unusual observations in the data. Furthermore, the graph shows an upward trend. Finally, the data is nonseasonal.



Next, we used ARIMA to select a model automatically. The model that was selected was an ARIMA (0,1,0) with drift, Figure 10. To evaluate the fit of the ARIMA(0,1,0) model with drift applied to the expenditure series (1948–1957), we conducted residual diagnostics. These diagnostics assess whether the model residuals exhibit white noise behavior. The following observations are based on the residual plot panel. This figure presents three key components: residuals over time, residual autocorrelation, and their distribution. In the first graph, the residuals fluctuate around zero, with no evident pattern or trend. There are no substantial systematic deviations, which supports the assumption of mean stationarity in the differenced series. While a few spikes occur, they are randomly distributed, suggesting the model has captured the data's underlying structure reasonably well. Overall, the residuals appear reasonably centered. The autocorrelation function (ACF) of the residuals shows that all lags fall within the

95% confidence bands. This indicates that the residuals are uncorrelated over time and appear to follow white noise, supporting the assumption that the ARIMA model has effectively captured the time-dependent structure in the data. Looking at the histogram, the residuals appear approximately symmetric and bell-shaped. This supports the assumption of normally distributed errors, which is desirable for producing reliable prediction intervals.

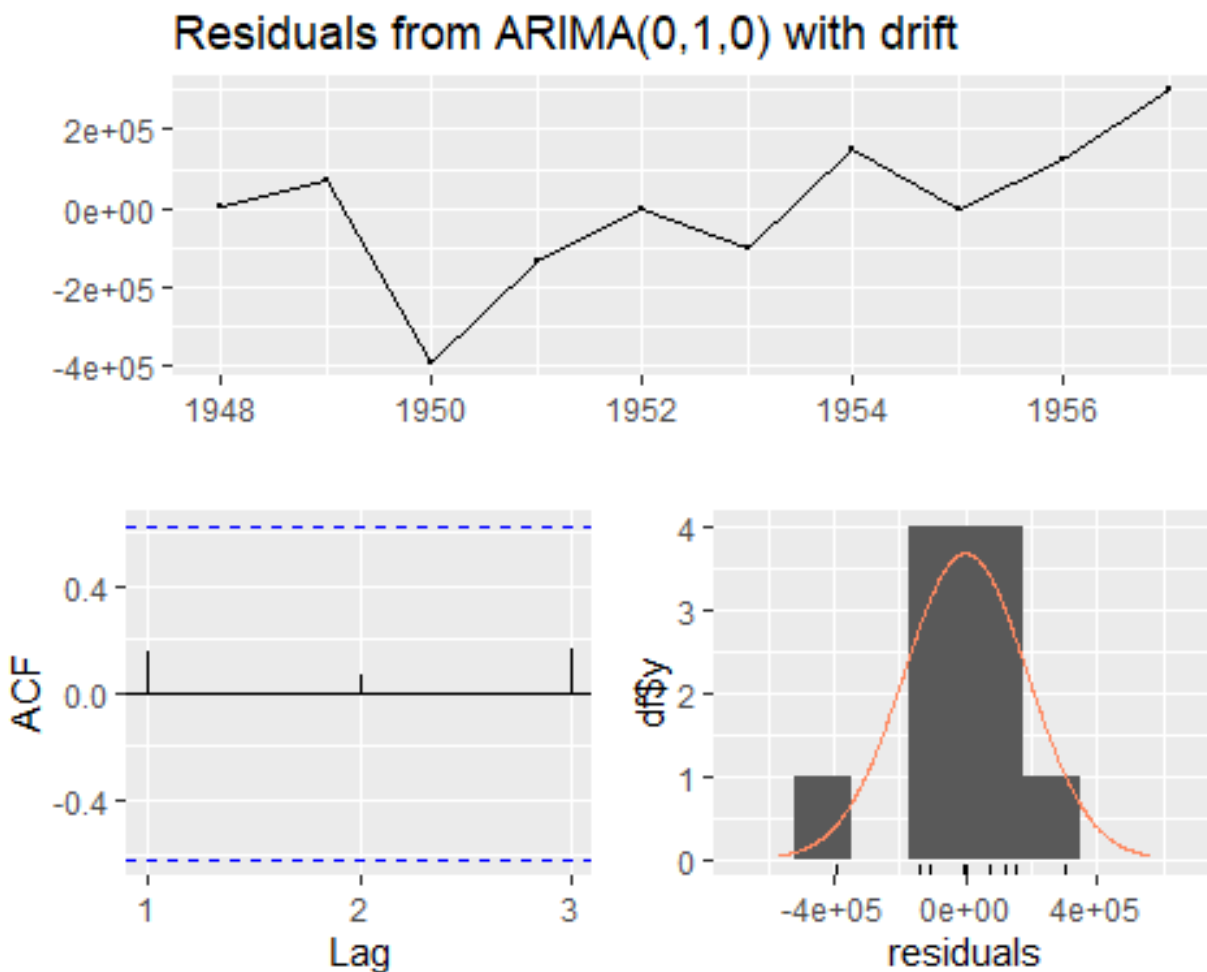


Figure 10: Residuals from ARIMA(0,1,0) with drift

As a result, the residual diagnostics in the diagnostic report provide no firm evidence of model inadequacy. The residuals appear to be uncorrelated, centered around zero, and

approximately normally distributed. Therefore, the ARIMA(0,1,0) model with drift is an appropriate choice for forecasting expenditures in this context.

To evaluate the independence of residuals from the ARIMA(0,1,0) with drift model, a Ljung-Box test was conducted using three lags (Figure 8). The null hypothesis is that the residuals are independently distributed; that is, there is no significant autocorrelation. Given that the p-value = .8415, which is substantially higher than the conventional alpha levels, we fail to reject the null hypothesis that the residuals are independently distributed. This indicates that the model residuals do not exhibit significant autocorrelation up to lag 3, suggesting that the ARIMA (0,1,0) model is a reasonable fit for the data.

Figure 11: Ljung-Box test

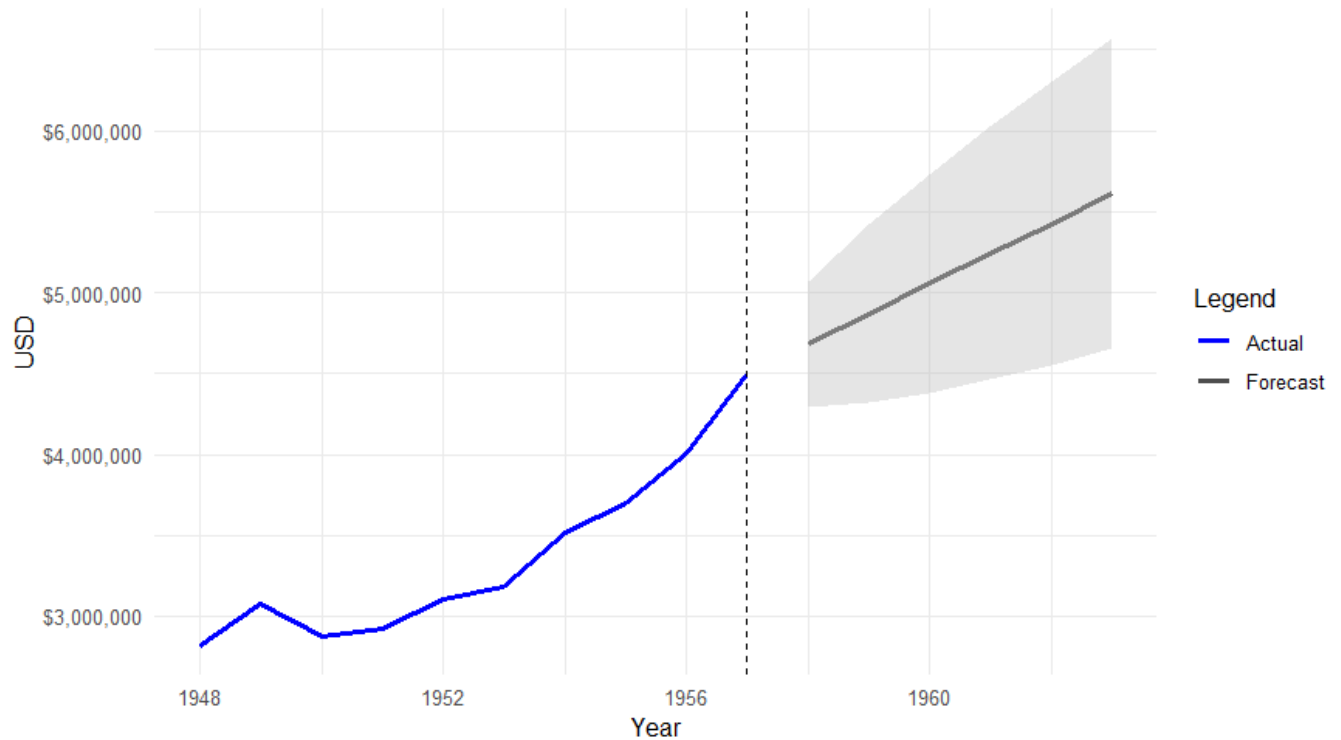
data: Residuals from ARIMA(0,1,0) with drift

$Q^* = 0.83319$, $df = 3$, $p\text{-value} = 0.8415$

Model df: 0. Total lags used: 3

Using an ARIMA(0,1,0) model with drift, Figure 12 presents a time-series analysis of total municipal expenditures for the City of Montgomery from 1948 to 1957, along with a forecast for the subsequent five years (1958–1962). The shaded area around the forecast line represents the 95% confidence interval, indicating the range within which the actual revenue is expected to fall with high probability. As expected, the interval widens over time, reflecting increasing uncertainty the further we project into the future.

Figure 12: Total Operating Expenditures: Actual (1948–1957) + Forecast (1958–1963)
with 95% Confidence Interval from ARIMA(0,1,0) with Drift



The table below presents the point forecasts and their associated 95% confidence intervals. For example, the forecasted expenditure for 1958 is \$4.68 million, with a lower bound of \$4.29 million and an upper bound of \$5.07 million. By 1962, expenditure is forecasted to reach over \$5.23 million, continuing the trend of annual increases.

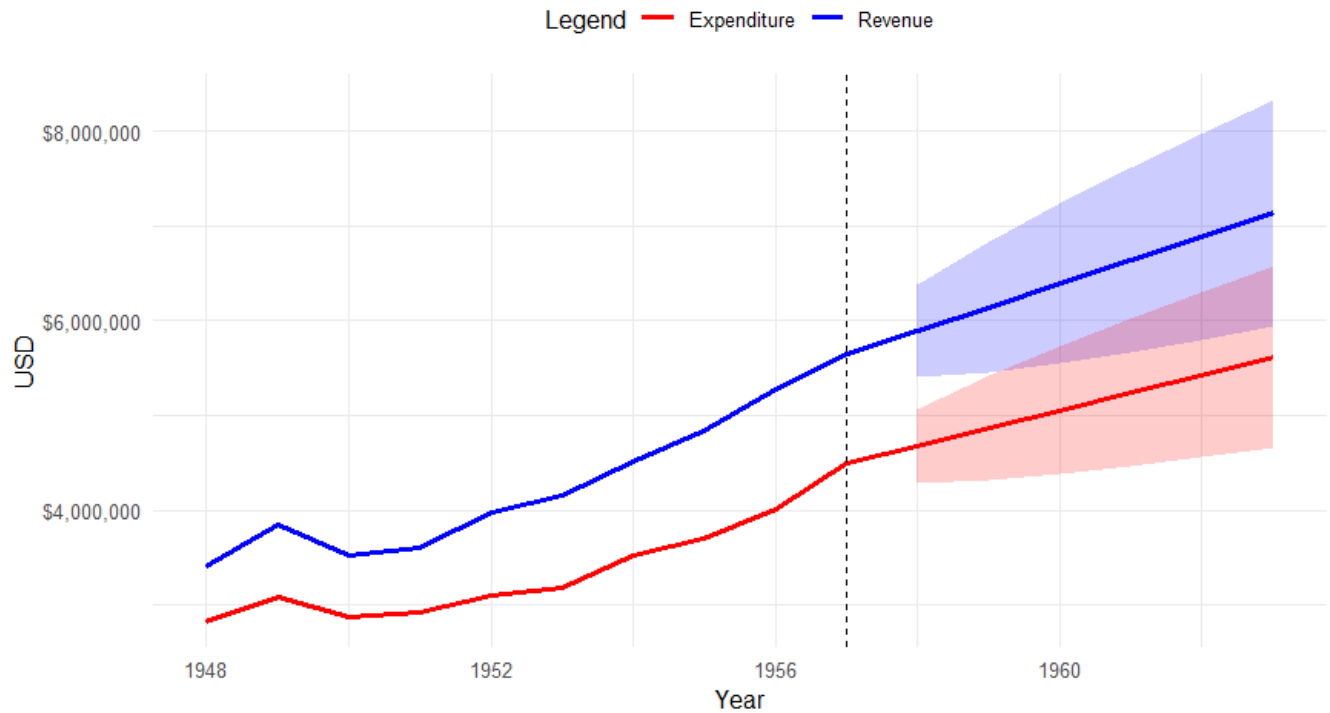
Table 4: City of Montgomery Expenditure Forecast Table (1958 – 1962)

Year	Expenditure	Lower 95	Upper 95
1958	\$4,681,540.58	\$4,291,537.08	\$5,071,544.09
1959	\$4,867,649.35	\$4,316,101.11	\$5,419,197.60
1960	\$5,053,758.13	\$4,378,252.24	\$5,729,264.02
1961	\$5,239,866.90	\$4,459,859.88	\$6,019,873.91
1962	\$5,425,975.67	\$4,553,901.32	\$6,298,050.02

Now that we have the forecast for the City of Montgomery's revenues and expenditures, Figure 13 presents a side-by-side visualization of actual and forecast city revenue and expenditures from 1948 to 1963, using an ARIMA(0,1,0) model with drift. The solid lines represent historical data from 1948 to 1957, while the dashed vertical line marks the start of the forecast period (1958–1963). Shaded regions around each forecast line represent the 95% confidence intervals, with blue indicating revenue and red indicating expenditure.

When evaluating the probability that revenues would fall below expenditure, this visualization suggests such a scenario is unlikely during the forecast period. The entire shaded region for forecasted revenue consistently exceeds the shaded region for forecasted expenditure, indicating that, even in the worst-case forecasted outcomes, revenue was expected to exceed expenditure. This visual separation between the two bands provides compelling evidence that the forecasted probability of a budget deficit was very low, supporting a favorable fiscal outlook for the city through 1963 under prevailing headwinds.

Figure 13: Revenue and Expenditure: Actual (1948–1957) + Forecast (1958–1963) with 95% Confidence Intervals from ARIMA(0,1,0) with Drift



The line graph in Figure 13 displays actual and forecast trends in city revenue and expenditure from 1948 to 1963, based on an ARIMA(0,1,0) model with drift. Historical data from 1948–1957 shows that revenues consistently exceeded expenditures, maintaining a positive fiscal margin. Forecasts for 1958–1963 indicate that both revenue and expenditure are expected to continue rising. However, while both lines trend upward, the 95% confidence intervals suggest increasing uncertainty in the forecasts, especially for expenditures, which show a wider band. Even with this, forecasted revenue remains above forecasted expenditures throughout the forecast window, indicating that if the boycott had continued, the city would likely avoid a fiscal deficit.

However, incorporating probabilistic analysis from Table 5 into the forecast reveals that the risk of city revenue falling below expenditure increases each year. As shown in the accompanying table, the probability of a fiscal shortfall was low at 1.03% in 1958, but rose

steadily to 16.25% by 1962. This growing risk highlights a trend toward fiscal vulnerability, even if average near-term projections appear optimistic. While the city's financial outlook appears stable in the near term, these probabilities underscore that the city faced increased fiscal risk the longer the boycott persisted.

Table 5: Probability City of Montgomery Forecasted Expenditure exceeded Forecast Revenue (1958 – 1962)

Year	Probability. Of.Loss....
1958	1.03%
1959	5.29%
1960	9.62%
1961	13.25%
1962	16.25%

Conclusion

In conclusion, it is clear from the accompanying analysis that the Montgomery Bus Boycott had a notable impact on the City of Montgomery's public finances. The data show that during the 1955 Montgomery Bus Boycott, the city of Montgomery faced not only a populace exerting pressure on government revenue, but also a government leadership that responded to that pressure with decisions and measures that led to increased government spending. These forces, co-occurring and fueling one another, placed the city in a vicious fiscal cycle that exerted enormous pressure on government operating margins. Using statistical analysis, this paper

presents evidence that the Montgomery Bus Boycott affected the city of Montgomery's public finances.

As it concerns the second question, forecast the probability that the City of Montgomery's revenue would have fallen below its expenditures. The data show a low probability that the City of Montgomery's revenue would have fallen below its expenditures if the boycott had continued. Specifically, the data shows a 1.03% chance of this happening in 1958 and a 5.29% chance of expenditures exceeding revenues in 1959. This is not to suggest that the Montgomery city leaders did not feel the financial pressures associated with the boycott. As noted earlier, in an attempt to resolve the conflict, the Montgomery business community was in direct talks with Dr. King and the MIA. The Montgomery City Lines bus company brought in its top leadership to help with these negotiations, and even the city clergy got involved in trying to resolve the disagreement.

It is worth noting that, financially, all of these groups had something to lose and did experience losses during the boycott. The business community was in danger of losing financial revenue from another Christmas shopping season boycotted. The Montgomery City Lines bus company had lost 85% of its ridership during the boycott. Black churches saw reductions in offering plate collections during this period due to the non-attendance of bus-riding members. All of these groups were interested in an expedient resolution to the bus boycott. The above data support the idea that, under the circumstances, all involved parties, regardless of their attitude towards or role in the boycott, were eager to see it end due to ongoing financial pressures.

It is important to emphasize that the data set used for the research on which these conclusions are based was limited because the available data were formulated on an annual, not a

monthly, basis. Getting monthly data would have helped determine a more precise date when the city would have reached the breakeven point, instead of providing a date range.

Another problem future researchers will face with the available data is information risk. From a political perspective, the 1950s were a tumultuous time for Montgomery. This means there is an increased risk of intentional misrepresentation of the data under political pressure. Contributing to this concern is the fact that during the 1950s, internal controls and oversight were not as strong as they are today. Also, transposition mistakes exist in the data due to the technology equipment used at the time. Given these challenges, future researchers must be vigilant in their handling of the data.

Another concern is that the city's annual report was silent on the health of the city's economy in the 1950s. A section concerning the health of the city economy did not appear in the city's annual reports until 1960. Seeing a report of this nature would help future researchers in their efforts to test the macroeconomic effects of the Montgomery Bus Boycott not only on the city of Montgomery but also on the central Alabama region.

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