Analysing the Causes of Detroit's Economic Downturn and its Future Development Based on Multiple Linear Regression Models

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Abstract
With the shattering of the glorious American dream, Detroit has transformed from a once world-famous industrial city into a ghost town with a lagging economy. Many sociologists and economists have tried to analyse Detroit's current situation and offer potential measures to revive it. For example, lowering corporate taxes to welcome tech companies to address excessive population loss, centrally funding Detroit's persistent government deficits, and investing in education and community to address higher than average crime and dropout rates. Seen in this way, improving the quality of life and happiness of the local people is a matter of urgency, as it is closely linked to the overall social climate of the United States.

More importantly, this paper also compares Detroit in the US with Northeast China, and finds that Northeast China is now in a similar situation to Detroit: it had a booming industry in the last century, but coincidentally declined in the new century. This highlights the importance of governance and improvement in Detroit, and once Detroit has been successfully reformed, the Detroit case can be used by "rust belts" around the world to develop more effective policy interventions. In this way, the recovery of most economies will contribute to the re-development of the world economy. Therefore, it is time to put Detroit's recovery on the agenda.

This paper attempts to provide another insight into what kind of factors caused Detroit's stagnant development based on the previous case through a linear regression model. Using GDP data from 2001 to 2018 for Detroit, New York, and the United States as a whole is quantitatively analysed with their respective unemployment , population and average incomes to find a more accurate relationship. The results show that Detroit's GDP has the most significant positive correlation to per capita income and the most significant negative correlation to unemployment.

Keywords
Detroit; Unemployment; Income per capita; Population.

Introduction

In September 2023, the University of Michigan's latest Detroit Economic Forecast stated that Detroit will recover steadily over the next few years and wages will continue to rise. However, despite rising wages, the report found that only 36 percent of Detroiters earn a living wage. This compares to 45 per cent in Milwaukee, 48 per

Citation: Yifan Zhao. (2024) Analysing the Causes of Detroit's Economic Downturn and its Future Development Based on Multiple Linear Regression Models. The Journal of Young Researchers 1(3): e20240930

Received on September 19, 2024; Accepted on September 23, 2024; Published on September 30, 2024

cent in Cleveland and 60 per cent in Chicago. It can be seen that since the American Dream was shattered, Detroit's standard of living has been far lower than other areas(Rice, 2023).

Certain area with stronf economic activity always rely on trade, finance, and technology industries to create economic value and accelerate globalization. For older cities, however, the picture is not so rosy. Detroit, the quintessential Rust Belt, was once known around the world for its automotive industry, and was even once named the epitome of the American Dream. The decline of Detroit's automotive industry due to the shift in the centre of global manufacturing has boosted the city's unemployment rate, and the departure of a large number of young people has contributed to Detroit's rapid decline. In 2008, GDP plummeted to $18.725 billion. At the same time, the incompetence of the local authorities fuelled the crime rate, making Detroit the most crime-ridden city in the US. The former prosperity has been reduced to nothing. Although, the situation in Detroit has eased after the epidemic and the city's economic situation is gradually picking up, it is still difficult for it to reach its former prosperity. This economic transformation is a wake-up call to the world, so national development policies need to avoid some of the problems exposed by Detroit, which will be better for the city's development.

The research background of this paper is to explore the factors and links of Detroit's decline based on previous literature and official statistics.

Research Hypothesis 1: Increased population loss is a significant cause of Detroit's decline.

Research Hypothesis 2: There is a strong correlation between development and per capita income in Detroit.

Research Hypothesis 3: Detroit's GDP growth is negatively correlated with the unemployment. The paper is divided into five parts: introduction, literature review, comparative analysis of the current situation of urban development, introduction to the model and data analysis. The first department briefly outlines Detroit's current dilemma compared to other cities. The second section is a summary review of previous scholars' analysis of Detroit's fiscal and livelihood situation, where local government deficits and the impact of globalisation have plunged Detroit into crisis. The third section is to interpret the findings of the study, comparing and discussing Detroit with existing studies in different countries or cities in terms of political, economic and social aspects. The fourth part is to create a linear regression model based on the time series, and the fifth part is to find out the relationship between Detroit's development and the size of population and unemployment rate and per capita income based on the stars and speculate the potential causes behind the data.

Literature review

The problems facing Detroit

The transformation of heavy industry has received attention from scholars around the world in recent years, especially in cities like Detroit. The development model of heavy industrial cities has often been difficult to keep up with the pace of national economic development. This inevitably leads to a serious decline in the local economic strength, and affects the quality of life of residents and social security. Therefore, transformation can not only help these cities to achieve industrial restructuring and upgrading and enhance the overall competitiveness of the city, but also improve the social atmosphere and enhance the confidence of local residents.

As of 2015, Detroit had been in a financial crisis for a long time. Shah and Nallathiga (2015) analyzed the main reason for this is the high unemployment rate that accompanies the lack of diversified industries. Indeed, automobile manufacturing used to be a brilliant industry for Detroit, such as Ford, which used to make huge profits through relatively low labor costs and hinterland, resulting in high economic returns. However, as global manufacturing shifted, Detroit lost its competitiveness in cheap production. More specifically, domestic manufacturing jobs were threatened by competition from rising economies such as

China and India. Even, Japan surpassed the US in the number of cars it manufactured in 1982 as sales increased by 29% (Kawahara, 2012). Due to cost pressures, Detroit's auto industry had to cut back on its workforce and move to lower-cost locations, which ultimately led to massive unemployment (Battista, 2023). Unemployment has brought Detroit's economy to a standstill, and more and more residents are leaving Detroit in order to survive and find better jobs. Based on Hodge (2017), poor economic conditions have also caused real estate prices and land values to drop, with some residents staying for cheaper housing, and tax revenues have become low due to the continued exodus and unemployment, which has had a bad effect on Detroit's financial sector.

In addition, Detroit had a net revenue deficit in the millions of dollars, and the government was no longer able to make ends meet (Anderson, 2013). Fiscal management is the most difficult challenge Detroit has faced in a long time, with the city resorting to short- and long-term debt in the form of issuing general obligation (GO) and revenue bonds. Detroit borrowed $1 billion through GOs, close to the city's $1.4 billion legal debt limit (Pollard, 2015). The city then defers interest payments in the short term to fill the revenue-expenditure mismatch. However, declining revenues were not even enough to cover government spending, much less pay off the debt. Over-reliance on long-term borrowing after declining revenues has again increased fiscal stress and worsened the government's financial position (Caldwell, 2017). This has led to a loss of investor confidence and a loss of Detroit's ability to raise resources through the issuance of public bonds.

Furthermore, globalization has not only stripped Detroit of its strong industries (as the authors will explain later), but it has also affected the living standards of the local population. The Wu (2009) shows that adults living in Detroit are more likely to be dissatisfied with their jobs and more financially stressed than Americans overall (38 percent in Detroit, compared to 25 percent nationally). True to form, the economy has become a major source of stress for Detroit residents. Living in poverty doesn't feel harmoniously good. Government spending on services has not been efficient, but it has also spent nearly half of its budgeted expenditures on public safety. However, due to the deficit problem, the government has cut back on certain services, which has negatively impacted the conditions in the Detroit community. This can add to the negative spiral of exodus and a further decline in tax revenues (Shah, 2015).

In terms of Newberry (2022), he found that renter poverty in Detroit is perpetuated by the implementation of city policies and tools that are inconsistent with the socioeconomic dynamics of renting in Detroit. At the heart of these dynamics is a cycle of financial instability and diminished capacity among renters, landlords, and city government

Contemporaneous situation in the United States

Looking at the United States as a whole, they also have been fighting inequality for a long time, but the situation has not improved. However, the trend of inequality can be reversed, for example, Brazil, which has one of the highest Gini coefficients, started to increase social spending on education and heal thcarw for the poor under the leadership of their president(Filho,2019). Through their efforts, their society became more stable and their economy began to grow. Today, although Brazil still has a higher level of inequality than the United States, Brazil has been working hard to change the situation, yet the U.S. government has turned a deaf ear and allowed inequality to increase. In fact, the situation of inequality in the United States is the result of market distortion. Today, wealth is created not through innovation but through the exploitation of the poor (Stiglize,2015).

Politically, the system increasingly operates in ways that increase inequality of outcomes and decrease equality (Makowsky et al.,2019).This is because the upper echelons of the political class use excessive power to shape the political system in their favour to the detriment of the rest of Americans: rent-seeking(Buchanan, 1982). Such practices, usually to the detriment of society, accelerate inequality between the rich and the poor, and make people less entrepreneurial. Such a financial sector tends to take advantage of information asymmetries, preying on these groups with predatory lending and abusive credit card practices to make large sums of money (Remiss,2012). The money of countless poor people can accumulate into a large sum of money.

There are other secondary causes of rising inequality. Firstly, monopoly markets play a role in this, as companies with ulterior motives create their own barriers even without government support. For example, in normal times, firms are able to maintain excess capacity, and as soon as someone wants to enter their market, they will increase production dramatically by lowering prices to make them nonprofitable. Then, the low prices makes them nonprofitable, and it is very difficult for the market to prosecute them for this kind of predatory pricing (Stiglize,2015). Another cause of inequality in the United States is patrimonial wealth, which is no longer acquired through hard work but through inheritance (Piketty,2014). Especially in the developed world, where population growth rates are so low, the wealth of the parents in most families is inherited entirely by the only child. Hereditary capitalism is leading the United States towards an oligarchy. Meanwhile, parental wealth has become almost the only factor in getting a child into college, with high tuition fees that the average family can't afford, and even if they could they would have a hard time graduating. It is a poverty trap, because education is one of the key factors for success, but the poor cannot have better options on the education. Another poverty trap is nutrition-based. The poor cannot afford basic food to keep them alive, and naturally they cannot work, especially since most of them are engaged in manual labour. Moreover, the poverty of these adults will cause their children to drop out of school (not because they can't afford to pay for schooling, but because they can find a job to support the family), and it is clear that such low-skilled people will not be able to find a well-paying job, and will ultimately fall into the vicious circle of poverty (Banerjee,2011).

Research method

Through reading the literature, this paper summarizes some of the methods of past investigations: on the social side, Wu's study used hierarchical linear modelling with 1,963 individuals within 66 neighbourhoods to analyze how individual-level variables such as race, class, age, gender, victimization, and contact with the police, as well as community-level factors such as racial make-up, concentration of disadvantage, residential mobility, and rates of violent crime, affect residents' satisfaction with the police satisfaction. This approach is a good analytical method that highlights the different and predictive effects of feedback from different ethnic groups faced with the same thing.

Second, housing is one of Detroit's challenges. Using the concept of plumbing poverty, Newberry(2022)'s paper investigates why housing policies in Detroit, Michigan, have failed to ensure adequate plumbing and water security for renters through interviews with city employees, community groups, renters, and property managers. His findings provide new insights into the connections between historical housing dynamics, policy implementation, and the instability of landlord-tenant relationships.

Hodge (2017) examines the extent to which assessment practices in the City of Detroit create significant inequalities in residential property property tax payments. He and his team used quantile regression techniques to determine how assessment practices change the distribution of assessments within and across property value groups and across asset value groups. The results suggest that current practices create large property tax payments on properties of similar value (horizontal inequality) and similar tax payments on properties of different value (vertical inequality).

Anderson's study (2013) focuses on local adaptation to fiscal crises. As a legal question, it exposes a potential problem that mayors, governors, state and local legislatures, bankruptcy judges, and state-appointed receivers must decide: How much of the city's share of city revenues can a city keep for its current residents? In addition, this paper explores the interests of residents and provides inspiration for policymakers and the public when considering essential public expenditures in cities at risk of debt default.

Increased program review and program adjustment

Detroit's development

Detroit experienced a rapid industrialization in the early 1900s, which resulted in great prosperity and wealth generation. In the late 19th century, it was one of the most successful examples of industrialization in world history. It was the Motor City that helped propel the United States forward, with the most famous company being the Ford Motor Company. In 1932, its Rouge River Industrial Complex was the largest integrated factory in the world, with its own wharves, railway lines, power stations, factories, over 100,000 workers, and 120 miles of conveyor belts(Thompson,2023). This production line and pace of work gave new arrivals a purpose and started a movement towards modernity and progress. Mass production led to mass employment, which in turn led to mass consumption. At the time, the influence of Detroit's auto industry giants like Ford, General Motors, and Chrysler, which dominated Detroit, was akin to today's Silicon Valley in California and tech monopolies like Apple, Google, and Twitter. Therefore, the prosperity of Detroit represented the American dream at that time.

Meanwhile, with the booming economy, Detroit's population skyrocketed from less than 80,000 in 1870 to more than 1.5 million in 1931, making it the fourth largest city in the United States at the time. To this end, Detroit built many schools and improved its educational system so that more newcomers could enjoy a good education and improve the overall quality of its citizens (Detroit Schools, 19th Century | Detroit Historical Society, n.d.).

However, the good times didn't last long since the 1970s, as mechanical repetitive production line work made Detroit uncompetitive and rapidly declining in the face of a combination of growing industrial competition from abroad and underlying social and racial tensions in Detroit(Zhou,2019). The failure of the government polarized society, with Detroit having the highest percentage of low-income residents (earning less than $25,000) as a percentage of the total population, and conversely, the lowest percentage of high-income residents (earning more than $150,000), proving that the majority of the people could not afford to pay for the basic cost of living (Racial Equity Highlights - New Detroit, 2021).

More and more people are leaving Detroit in order to survive and looking for jobs in other cities, leaving Detroit short of a basic workforce and devastated. Up to now, Detroit’s average annual unemployment rate jumped from 15.62% in 2008 to 23.9% in 2009, which is higher than any other city in Michigan. In conclusion, Detroit had to face the adverse effects of decline from different perspectives.

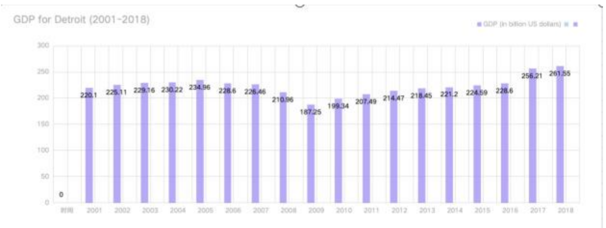


Figure1.The GDP of Detroit since 2001 to 2018

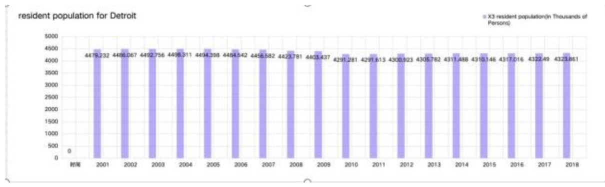


Figure2. The Resident Population of Detroit since 2001 to 2018

Comparing Detroit with other American cities

Figure 3. Map of the US and Detroit

In retrospect, the paths of putative development in major U.S. cities went to different outcomes in the 19th century. After a half-century-long struggle, Detroit finally declared bankruptcy in 2013. The value of housing decreased by 14%. The depression in housing prices hurt the administration of Detroit's government as their government funds dwindled rapidly due to falling taxes. Similarity, Flint, the same state as Detroit, does not fare as well, with a wide wealth gap and 60% of its children living in poverty(Rahman, 2022). Whereas, when we look at New York, the real GDP for finance and insurance in New York was $33.3 billion per year (seasonally adjusted), the highest in the state in the 1st quarter of 2023. However, the trend in overall inequality in the United States is serious, with 76 percent of the wealth in the hands of the top 10 percent of the population. The bottom 50% of the population only shares 1% of the wealth. In other words, the underclass in some cities became desperate.

Concerning the social level, Detroit became one of the unhappiest cities in the United States(Marini, 2024). Citizens began to lose their faith in Detroit. Similarly, the exodus from Detroit continued; from 1950 to 2010, Detroit's population decreased by 61.4% (Detroit: Past and Future of a Shrinking City, 2023).This is because the residents have to ensure their most basic food, clothing, and quality of life, but Detroit could not provide them with an excellent place to stay and live due to low tax revenues caused by low turnover and high unemployment, let alone social benefits. Meanwhile, its population peaked in 1950 with a population of 1,849,568, but it is now 65.8% smaller than it was in 1950 (Detroit, Michigan Population History | 1840 - 2022, n.d.). Thus, Detroit's economic situation and livelihood dropped to a freezing point.

In terms of New York, its government has a large number of social benefits and subsidies, such as the SNAP program. The Supplemental Nutrition Assistance Program (SNAP) issues electronic benefits that can be used, like cash, to purchase food. SNAP helps low-income working people, senior citizens, the disabled, and others feed their families. Social benefits like these allow residents to enjoy a good quality of life, give them peace of mind, and attract them to live and work in the future. Therefore, New York has attracted lots of talented people and allowed the economy to grow. And the same time, New York vigorously developed the financial industry and service industry and became today's top financial city.

Compared with Detroit, it is scientific and technological development no longer kept pace with the times, and they had no way to attract technical talent to figure out how to innovate in industry. Michigan's economic prosperity has historically relied heavily on the U.S. auto industry, so the state's economic decline has largely coincided with the decline of the state's major industry(Michigan’s Knowledge Economy Lagging Behind Other States, Study Shows, 2024). Because of the global shift in manufacturing, massive labor forces began to concentrate in Asia, such as Vietnam and Japan. They were able to produce more assembly-line cars at a very low cost, causing Detroit's automotive industry to be stymied and uncompetitive.

Comparing Detroit with other cities

When looking to the east of the world, between 2013 and 2022, China's gross domestic product (GDP) grew from 59.3 trillion yuan to 121 trillion yuan, with an average annual growth rate of more than 6 percent, and the total economic output, converted at the average annual exchange rate, reached 18 trillion US dollars, firmly ranking second in the world (China's GDP Expands 12.7% in H1, n.d.).

However, in such a new economy, China also has its own rust belt—the Northeast. The area is known in China as the Rust Belt due to the collapse of its once-powerful manufacturing sector and the slowing of China's northeast. Its growth rate has dragged the country down, and the trend is very similar to that of Detroit's economic development.

From an economic perspective, historically, such an economic predicament is very similar to that of Detroit, whose pillar industry is automobiles. The assembly lines and the rhythms of work gave new arrivals a purpose and set in motion a relentless movement towards modernity and progress. Mass production would lead to mass employment and, in turn, enable mass consumption. Detroit was the world's greatest working-class city and the most prosperous nation on earth. Looking at China, the Northeast has heavy industry, which makes them just as prosperous. Liaoning's GDP was 22.92 billion yuan in 1978; Guangdong's was 18.585 billion yuan; Heilongjiang's was 17.48 billion yuan; and Jilin's was 8.198 billion yuan, making the three northeastern provinces 2.6 times larger than Guangdong (China GDP - Worldometer, n.d.).

The original prosperity of the Northeast was attributed to its unique resources: firstly, there was a large amount of arable land, which could provide abundant agricultural products, and then timber, iron ore, coal, and other minerals were also very abundant, laying the foundation for industry. Next is transport. At that time, the Russian Empire needed to invade the Northeast, so the Middle East Railway was built in the Northeast (Ma, 2017). Since then, the Northeast has become China's most dense railway area. At this time, the Northeast vigorously developed industry, became the most industrialized place in China, and exported a large number of advanced equipment and machinery. The prosperity of heavy industry led the Northeast's economy to rise rapidly. However, in recent years, China's traditional industries such as coal, oil, and machinery have reached the ceiling. This is because the industrial structure of the Northeast is very homogeneous, focusing mainly on heavy industry. This has led to a structure that is prone to rigidity. Once overcapacity occurs in such resource-based industries, the economy of the Northeast will be plunged into depression, and it will be difficult to alleviate it in the short term.

In economies like Detroit and the Northeast, an exodus of population is something that cannot be avoided. Detroit experienced a 61.4 percent decrease in population from 1950 to 2010, lowering its ranking from the fourth most populous city in the U.S. to the twenty-seventh (Detroit: Past and Future of a Shrinking City, 2023). Many talents could not give play to their talents here, so they had to leave.

In China, people escape from the north to Beijing and Tianjin, the Yangtze River Delta (YRD), and the Pearl River Delta (PRD). Because the Northeast has long been a planned economy, it is corrupt and inefficient. Many veteran officials are too old-fashioned to innovate, preferring to hold on to past glories rather than take the initiative to change, making it difficult to implement new economic ideas. It is also because of such deep-rooted narrow-mindedness that investors will not be attracted to this place but will instead be attracted by the opening up of the coastal areas (Dong, 2005). This is why the northeast is in decline today.

Construction of model

Time series analysis

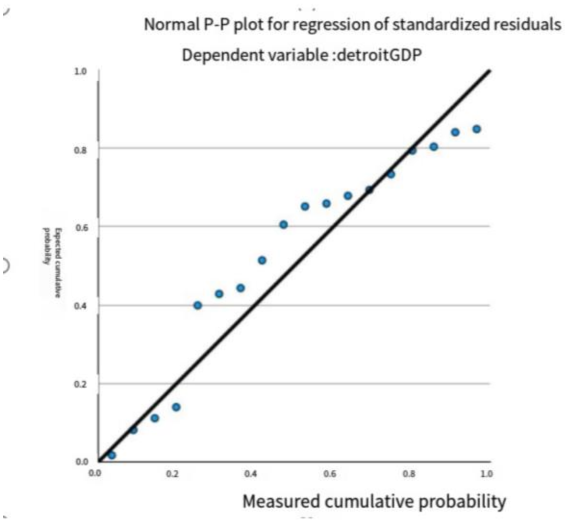
This paper adopts time series analysis research method with multiple linear regression model to deeply analyse the factors of Detroit's decline.

Time series analysis is one of the quantitative forecasting methods. It includes general statistical analysis (such as autocorrelation analysis, spectral analysis, etc.), the establishment of statistical models and inference, as well as on the optimal prediction of time series, control and so on. Traditional statistical analysis assumes that data series are independent, while time series analysis focuses on the interdependence of data series. The latter is actually a statistical analysis of the stochastic process of discrete indicators, so it can be regarded as a component of stochastic process statistics. Time series analysis is commonly used in the macro-control of national economy, comprehensive regional development planning, meteorological forecasting, environmental pollution control, ecological balance, astronomy and oceanography. Therefore, the time series model of Detroit constructed in this paper is able to reflect the mathematical model of dynamic dependence contained in the series more accurately, and is able to make forecasts of Detroit's future economic trends.

Multiple linear regression model

This paper finds the relationship between the dependent variable (GDP) and three different independent variables by using data from different regions of the United States to explore patterns and paths of influence. The reason for choosing GDP as the dependent variable is that GDP is the core indicator of national economic accounting and an important indicator of the economic status and development level of a country or region. Therefore, the change or fluctuation of the value of GDP can show the comprehensive economic level and living standard at that time. By comparing the GDP of different countries or regions, we can understand the living standard and development level of the people in each country.

The three independent variables are per capita income, unemployment and population. Per capita income is mainly used to reflect the consumption and saving levels of residents, and such data can then be used to analyse or predict the respective development situation and potential of different cities. Another variable is the size of the unemployment rate. If the unemployment rate is kind of high, it indicates a downturn in industry or social unrest in the area. Therefore, the unemployment rate can be taken as a very important indicator of whether the GDP is increasing or whether the country is developing or not. x3 is chosen to be the number of inhabitants living in the population, which is an implicit indicator of people's expectations of the local area and its potential for development. Excluding residents who cannot afford to leave some poorer areas, most residents move to areas with high quality of life, job opportunities and social benefits. Therefore, data on population size can also reflect the level of local development.



Data collection and analysis

Data collection

The focus of this paper is to examine Detroit's serious problems today and its prospects for possible future growth. Therefore, for this paper, we chose 2001-2018 Detroit's GDP, per capita income, unemployment, and population size data to model. A time span of close to 20 years is enough to shed light on the city's trends.

In addition, the modelling analysis does not only include data from Detroit only, but also covers New York and the US in general. By looking at the pattern of New York, it can compare Detroit's economic downturn horizontally, thus trying to analyse the differences between Detroit and New York's industry types or government policies, etc., can find out the reasons for Detroit's economic downturn in the subsequent research. By comparing with the development of the United States as a whole, economists could visualise the gap between Detroit, a limited region, and the development trend of the United States as a whole, which will reflect the shortcomings of Detroit. It also points out the future growth direction that Detroit should focus on, making the whole study more comprehensive and specific.

Data analysis

The data in this paper were analysed by SPSS to find out the correspondence between the Y variable (GDP) and the X variables (per capita income, unemployment and population). The result is that per capita income is positively correlated with its GDP values,the size of unemployment is negatively correlated with the GDP values, and total population is also positively correlated with GDP development. It is only the specific values that vary in different regions.

Table 1. The Spss result of Detroit

Influencing factors	BETA
Personal income per capita	0.987
Unemployment	-0.255
Population	0.748

The results of the spss analysis show that. The Beta coefficients of the three independent variables (personal income per capita\ unemployment\population) with respect to Detroit are 0.987, -0.255, and 0.748, respectively. In this case, personal income per capita and population are positively correlated with Detroit's GDP, while unemployment is negatively correlated. The results of the data can be seen, when the per capita income of the residents here becomes higher, people will have stronger purchasing power, people tend to increase consumption due to wealth effect, or local entrepreneurs will carry out some investment activities to promote the activity of the whole market, the company can be easier or faster to finance the capital to expand production. Companies will be able to finance more easily or faster, expand production scale to achieve economies of scale, and the economy will develop.

Table 2. The Spss result of the New York

Influencing factors	BETA
Personal income per capita	0.783
Unemployment	-0.007
Population	0.232

Relative to New York, the Beta coefficients are 0.783, -0.007, and 0.232, respectively.Within this, Personal income per capita and Population are positively correlated with New York's GDP, while unemployment is less but still negatively correlated with GDP. As a financial city, New York's many business opportunities attract waves of residents. An increase in the total number of residents tends to lead to more economic transactions, keeping New York's GDP high.

Table 3. The Spss result of the US

Influencing factors	BETA
Personal income per capita	0.193
Unemployment	-0.100
Population	0.807

The Beta coefficients are 0.193, -0.100, and 0.807, respectively, relative to the U.S. as a whole. Personal income per capita and population are positively correlated with U.S. GDP, while unemployment is negatively correlated. In the U.S., if unemployment increases, people will be idle and these idle labour force puts the whole U.S. economy into recession because the population has no income per capita.

Personal income per capita is one of the most commonly used indicators of economic performance and changes in the fortunes of the local economy. Income adjusted for the amount spent on wages and compensation, other labour income, and so on. Personal income per capita in the United States defines the personal income of a particular area, earned by or on behalf of all persons residing in that area. This income indicator is calculated by dividing the per capita income of the residents of a given area by the population of that area. In this survey, the Beta coefficients of per capita income for Detroit, New York, and the entire U.S. are 0.987, 0.783, and 0.193, respectively. This suggests that when people's per capita incomes increase, the GDP tends to increase as well. In detail, the relationship between GDP and personal icome per capita in Detroit is higher than that of New York and higher than that of the entire United States. The reason for this is that Detroit's overall economic strength is average and most of the economic activity is due to local residents' consumption or transactions. Whereas the correlation for New York is not as strong as Detroit's because the private consumption of residents is only a small portion of their diversified financial markets, which have more industries and investment services in this area such as stocks or securities.

The Beta coefficients of unemployment are -0.255, -0.007, and -0.100 for Detroit, New York, and the U.S. as a whole, respectively. Gross domestic product (GDP) and the unemployment rate have a negative long-run relationship. New York is relatively insensitive to the unemployment rate so it is below the US average. This is because New York is more of a technology-based industry and the demand for people is not as strong. Detroit's value is higher because heavy industry is the main industry in Detroit, so it is more dependent on labour. Furthermore, because Detroit is more aging, the labour force itself is insufficient. So when the unemployment rate increases, it is not able to fill the jobs and the development of Detroit will start to stagnate.

Population's Beta coefficients for Detroit, New York, and the U.S. as a whole are 0.748, 0.232, and 0.807. The population factor is important for Detroit because it relies heavily on heavy industry for its economic development. This explains that human resources are in relatively high demand for Detroit, and the amount of goods produced depends on the amount of labour. As for the more developed city, New York, as a first-tier city in the United States, the labour market is already saturated although competition is stimulating. If new industries are not added, the demand for inflow of people or labour is not so high. Thus, the number of residents does not have a great impact on the GDP development of New York.

Conclusion

This paper analyses qualitatively and quantitatively Detroit's structural problems such as mass unemployment and crime, mainly due to the economic downturn, loss of comparative advantage in manufacturing and incompetent government. At the same time, comparing Detroit to the economic strength of the U.S. mainland, it is found that Detroit is far below the average of the entire U.S. cities. This not only shows the geographical development differences in the US, but also shows that Detroit does have its own unique and huge economic and social problems. The global data reveals that in China's three eastern provinces GDP is also in a downward spiral and has a strikingly similar development history to Detroit's, with the decline of mechanised heavy industrial cities. But now, with the explosion of tourism in Northeast China, the economy is starting to recover. It's not as fast as other Chinese cities, but it's still going strong. Detroit's economy, however, remains stagnant.

According to the SPSS analysis, per capita income has the greatest impact on Detroit's economy. This implies that increasing Detroit's per capita income is the fastest and most effective way to grow Detroit's economy. Spatially targeted reforms can create jobs by bringing better profit opportunities to lagging areas and attracting businesses. Examples include tax incentives and investment subsidies for specific areas. Stable public or public funding can arrive at the building requirements of agglomeration economies and other competitive advantages of local economies, a new beginning for Detroit's development. In addition, Detroit can increase its revenue through tourism. This is because the city of Detroit has a long history and they can attract foreign investment and foreign tourists by promoting the "Glory of the American Dream". They could also open an automobile museum to get more people interested in the city. In this way, Detroit's economy might thrive again.

Apart from the economic aspect, social problems are the most serious problems plaguing Detroit. Unemployment due to the recession, coupled with an extremely high crime rate due to government incompetence, has directly led to Detroit becoming a ghost town. Ways to change this situation are.

1.Increase affordable housing to ensure economic stability.

This is because affordable housing is a social benefit for the homeless or those who cannot afford the higher cost of living. With the money saved on rent, they can spend it on other things, such as food, as a way to improve their quality of life. In addition, affordable housing gives them a greater sense of security, so they can focus more on their work and less on thinking about homelessness.

2.Expand on-the-job training and apprenticeship programmes

In this way, mobility, both occupationally and geographically, increases and employees can be more flexible in their job search. On a personal level, when a person has a good job and living situation, they won't want to give up the good things they have now to commit a crime, because a crime means a long period of incarceration and a stain on their record. On a macro level, crime throughout Detroit could be drastically reduced and social mores could be gradually restored. The government could save a lot of the budget spent on solving crime to invest in better social welfare or more promising industries. Importantly, there are also substantial local externalities in knowledge, ideas, and technology that can be transmitted to local firms through colleges, universities, research institutions, and scientific and technological research.

Conflict of Interests: the author has claimed that no conflict of interests exists.

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