Introduction

The development of infrastructure elicits positive effects for a nation’s economy. This has been theorized across many economic theories, and recent studies have proved its effectiveness. According to Ernest and Young, an Ontario eight year public infrastructure development project raised productive capacity of the province by 2.1%. By funding public amenities, societies are able to be more efficient in their input and production, therefore allowing for a lucrative, successful economy.

Macroeconomic policy refers to developing a stable economic situation in a nation, which will subsequently induce future economic growth. More broadly, the focus is on the economy as a whole rather than specific homes or investors. The policy accomplishes this through fiscal policy, monetary policy and exchange rate policy, all of which contribute to a stabilizing economy.

However, ideas to consider include the longevity of the impact by such infrastructure. In some areas, investment into infrastructure resulted in short-term economy booms, such as agricultural investments in Bangladesh, according to Brookings. Furthermore, such infrastructure must be constructed well and have the highest quality as possible in order to benefit generations to come and prevent their deterioration.

The bond between macroeconomic policy and the development of infrastructure could therefore be strengthened as both tools work to ameliorate similar issues in society. Macroeconomic policy strives to improve unemployment rates by virtue of the job opportunities that arise through the development of infrastructure. Furthermore, a theory behind infrastructure spending states it stimulates the economy, causing increases in demands for goods and services, and it accordingly results in price increases. Hence, this addresses the macroeconomic concern of price instability by acting as a tool for when prices begin to drop. Macroeconomics also is largely focused on creating economic growth for a nation.
Infrastructure does so through its ability to create a more efficient society, whether through transportation, job opportunity, or movement of traded goods.

As the focus of macroeconomic policies is to better a nation’s economy, infrastructural development and macroeconomic policies are largely compatible in their objectives. Increasing centrally planned infrastructure could therefore serve as a factor to bettering macroeconomic policy.

Definition of Key Terms

Macroeconomics

One of two major economic groups, which focuses on the general function of the economy, and does not focus on the economy’s impact on individual consumers and producers. Relative to GA2’s question regarding macroeconomics, policies are the actions taken to achieve a macroeconomic goal of general social prosperity.

Infrastructure

The organizational factors of a society necessary for economic productivity. It is the physical networks and facilities, such as highways, the Internet, and more. Furthermore, infrastructure may also exist in “soft” form, as education and public health systems can also be viewed as infrastructure. Such infrastructure, as previously stated, can result in major economic development for the member nation.

Bond Financing

A long term loan borrowed by a nation to invest in long term infrastructure development through the sale of bonds to investors. This loan opportunity may provide an option for the creation of a connection between macroeconomic policy and infrastructure, as long-term, risk-filled loans must be allocated and regulated carefully, and hence considered a part of macroeconomic policy.

External Debt Sustainability

External debt results from loans countries take from outside sources, such as international organizations like the IMF, or from other countries. Making sustainable external debt involves the creation and enforcement of new policies that prevent a nation being unable to recompense their external debt, or being held at demands in cannot reach. In such cases, paying back their loans would result in irreparable damage to the nation’s own economy. By ensuring said sustainability, loans credited for the purpose of infrastructure development would not be detrimental to a country’s macroeconomy.

Opportunity cost

The resources or opportunities “lost” from an option which was the very next choice to the current choice. As such, when a country makes a decision between alternatives, the option not selected and the benefits it would have yielded for said nation are known as the opportunity cost of that decision. In relevance to macroeconomics, an opportunity cost may exist upon choosing how to better a nation’s economy. It forces individuals and governments to consider what the best, most productive policy would be in accomplishing their goals, as they must make decisions that minimize opportunity cost: the decision that would have the best outcome, despite the other benefits not gained from selecting a different path.

Background Information

Infrastructure development

Infrastructure development refers to the funding of items such as bridges and roads along with public amenities, including energy, electricity, water supply, and the Internet. In Keynesian theory, increased development of infrastructure results in economic benefits for a nation. It is believed that by investing in the public while unemployment is high, aggregate demand will increase along for suppliers, job opportunities will multiply, causing a raise in the economy.

Benefits

The effects of infrastructure on economic growth are commonly referred to as ‘multipliers’ due to their significant development. Due to this large potency, the benefits of infrastructural development are bountiful. Productivity growth in a nation could increase as resources are more plentiful and allow for greater market yields. Furthermore, the rate of return for infrastructure is very large due to their consistent relevance in society and constant use. To illustrate, the Economic Policy Institute (EPI) reports that for every $100 invested, national output is increased by $17. These high return rates, along with sales tax revenue, can largely benefit governments and consequently allow them to invest even more in public projects. Ernst and Young approximates the growth of income taxes in Ontario, Canada as $2 billion higher due to the province’s development. Infrastructural development offers increased employment opportunities for people, as jobs arise from the need of the construction of infrastructure to its upkeep. Many economic functions, such as transnational trade, require strong infrastructure to function. Infrastructure facilitates development and improves the quality of work individuals can partake in. Therefore, the immediate effect of infrastructure is a large boom in both development and income.

Limitations
Infrastructure development does not target all geographical areas equally. Development may be prioritised in some areas over others, resulting in an imbalance of consumer and producer input and output, therefore causing a misallocation of resources. Investopedia describes this negative result as governments’ choice of short term benefits over the long term ones. While such development will evidently cause short term economic booms in terms of reduced unemployment, in the long term the resource misallocation can result in even higher levels of unemployment. Furthermore, the current enforcement of “green” infrastructure practices appears to target nations of varied ability differently, as MEDCs may have more funding in order to participate in environmentally friendly development. Meanwhile, LEDCs struggle with creating sustainable, low-pollutant infrastructure as they may lack the necessary technologies and developmental advisors.

The opportunity cost for infrastructure development is completely unknown due to its unpredictability. Hence, governments cannot be sure that the funding they place on infrastructure would not create better economic development by being invested elsewhere, such as in the educational sectors, and cause improved amelioration of unemployment and such factors. This is due to the general challenge found for economics and other social sciences in measuring and predicting results. As a result, few papers have been able to conclusively prove the economic benefits of infrastructure development, including a 2014 research report by the International Monetary Fund (IMF). A similar Turkish 2017 study found that while infrastructure did have a positive effect on the economy, this was at a much smaller level than previously anticipated, as infrastructure was a singular factor impacting the economy. Many other factors, such as employment and natural resources caused a greater influence on nations’ economies.

**Funding for infrastructure**

*External*

Nations may partake in bond financing for their infrastructural development. In contrast to typical external debt, bond financing allows nations to repay their debt because of infrastructure’s lucrative manner. Therefore, nations will not remain unsustainability indebted to other nations, but rather will be able to use such investment bonds to better their economy rather than harm it from debt. Furthermore, by utilizing the bond market countries can gain revenue, which places external funding as a positive option for many countries. There are two way problems here; LEDCs have a high likelihood of defaulting on bonds, a situation that is exacerbated by poor governance and corruption, which leads to unfair agreements which unfairly benefit foreign investors at the expense of the LEDC.
Taxes make up a large section of where funds for public projects come from. Paid at regular time intervals, taxes allow governments to have a focused monetary fund for public works. However, when it comes to high demand infrastructure, these funds may not be enough. As a result, Public-Private Partnerships (PPP) has become another popular funding method. These partnerships combine the public and private sectors in creating revenue for infrastructure. Private investors may choose to fund infrastructure projects that are targeting in helping the public sector because they may later receive benefits from their actions. The combination of the two groups is bilaterally beneficial, as the private sector gains revenue and the public gains infrastructure.

However, governments’ public sector budgets are becoming depleted. In the U.S, for example, municipal bond markets are becoming an unattractive option for investors due to their low interest and tax rates. Due to low tax rates, private investors are unwilling to fund such bonds as they are unable to gain any private benefits from them.

Private investment from the private sector, such as pension plans, life insurance companies, and sovereign wealth funds are consistent and dependable sources of revenue, according to Aecom.

**Macroeconomic policy**

The actions to be taken in order to improve the overall economic standard of a government. The World Bank specifies that macroeconomic policy will tend to reduce uncertainty and risk in the policies that are created, as stability in macroeconomics acts as a basis for economic growth, along with determining the distribution of income across a nation. There are varied policy types that allow for this to occur. Furthermore, macroeconomic policy specifies a country’s stance and action steps in terms of international trade and external debt sustainability. As such, a nation’s macroeconomic policy will determine how the nation participates in the international financial system. In this system, countries collaborate in creating a global, intersecting economy. Hence, based on each country’s personal goals and economic requirements, their participation in international action such as trade or the financial system may vary.

**Fiscal, monetary, and exchange rate policy**

Changes in government spending, taxes, and borrowing, when done with macroeconomic ideals in mind, result in policy that can improve economic growth. The only aspect of macroeconomic policy that is under government control, all actions governments take have the final outcome of the nation in mind. This is fiscal policy, where the work of the government can result in change for the nation.
Monetary policy is the change of cash rate, such as the interest rates in money markets. According to the Parliament of Australia, such changes influence both savings behavior and investment behavior. The change of cash rates is typically done to balance the demand and supply of nations, as price rates may be increased when demand is too elevated, and vice versa.

Similarly, the exchange rate policy is regarding money. However, it is focused on how a nation’s currency compares in value to international currencies. This value may increase or decrease depending on the balance required to maintain countries’ well being in the international community. In this respect, a high exchange rate will be more beneficial to a nation, as they will receive more of a foreign currency in exchange for their own. Furthermore, a higher exchange rate results in an increased purchasing power for a nation, as importing goods will be significantly cheaper if a country’s currency is higher in value than the imported one. Consequently, a low exchange rate may also be good for a country when they are trying to increase their export rates, as many high currency nations will be attracted by a lower value currency to import.

Major Countries and Organizations Involved

Canada

Canada’s province of Ontario is a prime example of how the development of infrastructure can impact a nation’s economy. Beginning in 2006, Ernst and Young reports that Ontario embarked on a costly infrastructure development project, ending in 2014 and spanning 8 years. The spending program caused positive effects on the economy, advancing the province’s productive capacity by 2.1% above the expected value and increasing average annual personal income by $7.4 billion USD per year. Additionally, the annual salaries of residents were raised, on average, by $1,000 USD. Furthermore, GDP of the area stood at $11.3 billion dollars higher, and 167,000 more job opportunities were created in association with infrastructure development in all sectors. In the corporate sector, profits grew by $2.2 billion USD. The benefits of the public projects were not limited to the public, however. The government also saw many benefits over this period; they had an average of $1.6 billion USD more revenue from personal income taxes and $583 million USD from corporate income taxes, along with indirect tax revenue summing up to $96.7 billion USD. Private investors were willing and able to invest in Ontario’s development because of the grand scale of the project, and long-term individuals’ use of the infrastructure would result in even more revenue. As a result of this growth from infrastructure development, Ontario illustrates the high importance of infrastructure to governments and societies, as it acts as a large factor in improving a region’s economy. Hence, making infrastructure a focus of macroeconomic policy, as was done in Ontario, proves to be a worthwhile cause.
Hong Kong

Hong Kong was rated in 2018 by the World Economic Forum (WEF) as the nation with the best infrastructure in the world based on its roads, airports, and other similar facilities. Hong Kong holds one of the most developed railway systems in the world, along with 1,138 miles of roads. The World Atlas claims that as a result of this efficient infrastructure, Hong Kong has allowed for economic developments, along with an opportunity for businesses to increase their growth and efficiency. Furthermore, its well established public transportation has created a large section of the population that utilizes it, making Hong Kong a country that is striving to reduce their pollution levels. Effects of Hong Kong’s infrastructure include the advanced movement of goods between ports, airports, and foreign nations, improving the nation’s economic efficiency in trade and supply.

International Monetary Fund

The International Monetary Fund (IMF) is an international organization that works to establish financial stability, economic growth, and inter-regional monetary cooperation. Additionally, they also work to establish currency exchange rates in the world. They are a United Nations based agency, and allow member nations to borrow money to pay debts they may owe other nations. As of infrastructure, the IMF strongly urges and prompts nations to invest heavily in the public sector in order to raise the investment in infrastructure. Due to this the IMF has an Infrastructure Policy Support Initiative (IPSI) to help direct the areas and quality of spending by countries on infrastructure. Through the initiative, the IMF also oversees the management of funds specifically for infrastructure by collaborating with nations during planning investment stages, allocating funds, and implementing projects with the specific budget and time frame considered. Furthermore, the IMF utilizes their risk assessment model to analyse potential risks created by Public Private Partnerships (PPP), along with analyzing the extent of debt that the country may face as a result of its investment. In response to this risk, the IMF also provides a management strategy for debt in order to ensure governments invest at full strength in the nation’s infrastructure.

World Bank

The World Bank is an international organization that assists less economically developed countries (LEDCs), among other nations requiring financial assistance with loans and grants in order to invest in capital projects. The World Bank also provides investment advice for countries in developing their infrastructure in a fiscally sensible and environmentally conscious manner, with the primary focus of efficiency: all money invested is to be used for the betterment of society, without set-backs or areas of spillage. Using smart but ambitious policies, the World Bank estimates countries would only need to use 4.5% of their GDP each year to meet the Sustainable Development Goals, while maintaining climate change to 2 degrees. Furthermore, the World Bank also holds sub-organizations that specialize on loan
giving to nations for the purpose of infrastructure development. This includes the International Bank for Reconstruction and Development, which provides funds for infrastructure development, the International Development Association, a group that offers guidance and oversees economic policies, and the Bank for International Settlements, which strives to help with loan opportunities for debt-clearance for nations that are indebted to foreign countries.

**Infrastructure Development Funds**

Many local “development funds” exist for the purpose of aiding nations in their development of their infrastructure. These funds offer monetary support to governments that may hold limited public income and investors to internally fund their infrastructure. Hence, the many organizations can offer support regionally, which is a more focused resource rather than what large, international, multi-focused organizations such as the IMF may be able to provide. These organizations include the Infrastructure Development Fund (IDF), a group based in the Netherlands funded by the FMO, a Dutch entrepreneurial bank. The IDF specifically funds infrastructure focused on clean and renewable energy, with a focus for sustainability.

**Municipal Infrastructure Development Fund**

Another such group is the Municipal Infrastructure Development Fund, (MIDF), a West Balkan support group, which works through partnered local commercial banks of each country. Long term sustainability of the Balkan region is the main goal of the group, which it attempts to accomplish through providing small loans that can train local banks in assets and subsidies, along with improving the municipal creditworthiness of the nations, according to the EBRD. Furthermore, in order to have minimal environmental impact, each local bank is supervised and overviewed by European parliament members, which all projects funded are analyzed throughout the investment cycle. National and EU law is also strictly abided by.

**India Infrastructure Project Development Fund**

A third group is the India Infrastructure Project Development Fund (IIPDF). The group claims to cover only a part of Public-Private Partnership (PPP) costs of infrastructure loans, in turn allowing greater use of the nation’s budget on infrastructure development. Furthermore, while the IIPDF states they do not cover the expense of staff, they do claim to provide funds for up to 75% of development projects. The group receives this money as an extension of the Indian government, and therefore it is not privately funded but supplemented by the Ministry of Finance.

**Pan African Infrastructure Development Fund**
Following them is the Pan African Infrastructure Development Fund (PAIDF). The group claims to be an “equity” fund that invests all across Africa in the investment for infrastructure, as well as invest in companies that accordingly have focuses on infrastructure and its development. Distinctively, PAIDF states their existence will create between 50,000 to 70,000 working jobs, therefore furthering the positive economic impact they will have.

### Timeline of Events

<table>
<thead>
<tr>
<th>Date</th>
<th>Description of event</th>
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<tbody>
<tr>
<td>22 July 1913</td>
<td>The International Federation of Consulting Engineers (FIDIC) Infrastructure conference is created.</td>
</tr>
<tr>
<td>1936</td>
<td><em>The General Theory of Employment, Interest, and Money</em> by John Maynard Keynes is published, commencing the Keynesian Revolution in economics and bringing forth Macroeconomic Policy.</td>
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<tr>
<td>1945</td>
<td>The first United Nations conference took place, focusing discussion on flexible exchange rates between nations.</td>
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<tr>
<td>1946</td>
<td>The International Bank for Reconstruction and Development becomes an institution.</td>
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<td>1947</td>
<td>The International Monetary Fund begins giving out loans to member nations.</td>
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<tr>
<td>1987</td>
<td>The term “infrastructure” is first used in a US National Research Council panel.</td>
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<tr>
<td>1989</td>
<td>D. A. Aschauer releases a study finding that infrastructure has a capital role on economic growth.</td>
</tr>
<tr>
<td>January 31, 2019</td>
<td>Donald Trump issued an executive order to nationalize all infrastructure materials and limit outsourcing</td>
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### Relevant UN Treaties and Events

  - This resolution highlighted and stressed the importance for the international community to collaborate on economic matters. The document further stresses the interconnectedness of nations’ economies, leading to a high importance in forming economies, through factors such as macroeconomic policy, with these bonds in mind.
- Protection of Critical Infrastructure, 13 February 2017 (*S/RES/2341*)
- External Debt Sustainability and Development, 2 August 2016, (*A/71/276*)
Previous Attempts to solve the Issue

Many unsuccessful previous attempts to relieve nations of poverty and economic disparity through infrastructure development have been promoted and attempted over the years. However, many such programs and suggested macroeconomic policy have had similarities that allowed their ultimate failure: an overall unsustainability and aid dependency.

An example of this situation is the New Partnership for Africa’s Development (NEPAD). In May of 2002, the group released an executive summary titled, “Short-Term Action Plan Infrastructure”. The image above outlines the Foreign Direct Investment in Africa. Immediately, the plan had limitations in its limited scope. By focusing only on short-term infrastructural relief, the plan created no real change in African economies through the introduction of infrastructure. Any macroeconomic policies were unable to have a strong benefit to nations as they did not truly accomplish anything other than temporary relief in extreme situations, such as temporary access to clean water through well building. However, such an action simply left communities dependant on the aid from extra governmental organizations that provided such aid, and did not benefit the community’s development. NEPAD claimed to fill the economic deficit of small African economies that prevented nations from being able to develop infrastructure, and consequently prevented efficient development and trade in the African region. NEPAD focused on the privatization of infrastructure projects of most critical importance in states and providing investment projects. To illustrate, NEPAD suggested development of energy infrastructure through macroeconomic policy that allowed the communication of several groups, including African countries, donors willing to contribute to the issue, and private investors in order to provide African nations with the necessary revenue for energy development.

However, NEPAD’s ultimate failure resulted from its explicit lack of long-term planning. In their proposal, the group explicitly states that their plan is developed as short-term, as a “first stage in a rolling
action plan that will be updated periodically as and when better information becomes available”. Furthermore, the proposal stated, “The Short-term Action Plan will be linked to and complemented by a Medium- and Long-term Action Programme.” This statement is the greatest error of the NEPAD. It is evident that long term effects of NEPAD’s actions had not been considered. However, in order to create an infrastructure that is beneficial to an economy, long term effects must be considered from the absolute beginning of macroeconomic policy development. This is the only manner through which infrastructure will be sustainable and not create economic deterioration in the future. NEPAD’s plan, however, to focus on short term goals and later develop long term plans based on the outcome of their short term development, provides a backwards and inefficient approach, as without considering the long term implications of development, more harm can be created than good. Similarly, the group’s generalization of the diversity of the nations in the African continent as simply “Africa” creates an inability for specification of long term action plans for nations, as each has specific requirements and needs from macroeconomic policy.

Further criticism of the NEPAD plan was its absolute dependence on aid. The plan utilizes donor funds, such as private donations from other nations or organizations, as its main resources for promoting infrastructure development in Africa. As a result, a large portion of African governments are unable to create significant development due to their reliance on donor support. However, a nation cannot be built using donor funds due to the high risk they carry; namely, the retraction of funds at any moment from the donor, along with the limited amount a donor can provide, in contrast to continuous, rolling revenue resources such as public tax revenue, a consistent source of income for governments to utilize in re-investment into the public sector. Such an example is in 2002, when Canada reduced their aid to Africa by 40%, resulting in a stagnation of African development, and a consistency in high poverty numbers.

Possible Solutions

Due to varied economic ability of nations, solutions will vary highly from country to country. However, at the most basic, infrastructure development should result in positive economic effects for a state through factors such as increased public revenue through it, facilitation of the public sector, and the infrastructure itself shall be sustainable in the long-run, as this would yield high economic benefits rather than outdated structures that must be revised as time passes. Lastly, for the safety of all, environmentally conscious decisions should be made when creating any sort of infrastructure in order to upkeep the Sustainable Development Goals (SDGs) set out by the UN. This, of course, is easier said than done.

Most recently, a group of seven UN entities have called for an “integrated” infrastructure development approach, which focuses on utilizing the SDGs to guide all infrastructure development. In
this regard, the groups recognizes that poorly developed infrastructure will simply cause more economic problems for nations, such as greenhouse gas emissions and ecosystem degradation. If these issues are not blocked before they occur, nations will have a greater economic loss attempting to repair such problems, such as the building of roads into environmental sanctuaries, leading to the poaching of species and ecosystem disruption, which may have catastrophic results. The UN calls this the “life-cycle approach”, where at every point of development and macroeconomic policy creation, environmental and sustainable checks are made. These considerations are also made early during planning times. As a result, ecological infrastructure functions are protected, preventing economic deterioration. As previously stated, countries that do not have large levels of funding for infrastructure planning may attempt to reduce cost by reducing primary planning of public plans and investment in public advisors. As such, LEDCs may struggle to utilize the proposed “life-cycle” approach in their development of infrastructure.

Lastly, the revision of macroeconomic policy must be strongly considered as a method through which to include infrastructure development more thoroughly into policy. As macroeconomic policy focuses on the overall economic impact of a nation, this branch of economics is often interconnected between countries. Hence, in order for macroeconomic policy to be revised with infrastructure in mind, it must be done so through the collaboration of multiple nations. By working collaboratively, a country will ensure that it will be able to follow along with their devised policies, as these policies will complement long term interregional relationships. Furthermore, creating policy that combines both private and public investment into infrastructure planning will balance a nation’s indebtedness and future sustainability. With competent economic advisors, policy can be created that lays out a clear, personalized plan for each nation in terms of their investment needs from their public/private sectors. As such, without clear policy set out by governments, infrastructure development will be inefficient. With effective policy, governments can create incentives for both infrastructure development and its investment.

**Guiding Questions**

1. How can a nation create macroeconomic policy that utilizes external investment for infrastructural development without falling by depending on such aid?
2. How can nations in dire need of infrastructure development maintain a high focus on sustainability and environmental consciousness while simultaneously addressing critical situations?
3. How can nations maximize public revenue without creating unsustainable taxation habits for its citizens?
4. To what extent can the international financial system be re-engineered to prevent debt unsustainability?
5. Where can countries receive training on infrastructural development and sustainability from?
6. How can nations accurately predict the long term implications of infrastructure development and macroeconomic policy?

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Appendix or Appendices


This issue brief is a primary resource resulting from multiple UN related agencies and their recommendation for infrastructure development in the world, with a focus on sustainability and environmental consciousness. This resource is highly informative in a possible successful action plan for infrastructural macroeconomic policy.


The resource from the World Bank provides a description of the current issue of infrastructure in a very accessible, understandable video. For anyone attempting to understand the issue of macroeconomic policy and infrastructure overall, this video provides a simple and accurate description of the problem and its resolution.

III.  https://www.imf.org/external/np/fad/publicinvestment/ (The International Monetary Fund’s relationship to public investment)

In this publication, the IMF uses many figures and description to demonstrate the effectiveness of public investment for a nation’s economy. The resource makes clear how public investment works, and the methods through which governments can fund public projects internally.


This website offers an in depth description, along with many examples, of exactly how macroeconomic policy is benefited by infrastructure development, and more specifically the link between macroeconomics and infrastructure. Furthermore, the website provides graphs that illustrate economic trends in response to changes in infrastructure. It is a highly valuable source in understanding the issue of macroeconomics and infrastructure.

This study is an interesting primary source in having a first-hand perspective on the impact between economics and infrastructure. It is a great source for statistics and real life examples of a difficult and conceptual issue.