UBI as a policy solution for technical unemployment in Industry 4.0?

Investigating the Viability of Policy Change to Hard Line Economic Management of Overhead Costs in Public Administration

by

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Abstract

Developing technologies like the internet of things (IoT), Cyber-physical systems (CPS), and machine learning improving Artificial Intelligence (AI), are dubbed as the industry 4.0. Industry 4.0 is predicted to be the fourth industrial revolution that would introduce new possibilities and increases in production efficiency. However, worries exist that advancements in technology will replace human labor. Advancements in technology are predicted to affect around half of all forms of current employment. A Universal Basic Income (UBI) is a publicly well-known argued policy solution that is also suggested by some academic literature. This study looks into UBI as a policy solution for the challenge of technical unemployment during industry 4.0. This study compares UBI policy implantation and experiments in a comparative case study. This research found that UBI as a policy solution would be less efficient at mitigating poverty than a means-tested targeted welfare policy solution. However, lessons learned from UBI cases can be used to improve welfare policies in other aspects.

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1.0 Introduction

Rapidly advancing technologies like the Internet of Things (IoT), Cyber-Physical System(CPS), and Artificial Intelligence (AI) driven by developments in machine learning are predicted to increase production efficiency and open up new technological possibilities seen as science fiction in decades prior. These advancements in technology are seen as the fourth industrial revolution, often called industry 4.0.

Innovations in technology can increase efficiency. These innovations would allow workers to work more efficiently and do more work in the same timeframe as before, or allow fewer workers to do the same amount of work as before the technological innovation. Historically, innovations in technology, like that of the computer, replaced human jobs. Frey and Osborne (2017) find that 47% of US current employment is in danger of being replaced by automation within the next decade or two. Fears exist that recent and future innovations in technology like AI would substitute human labor. That would leave humans without a means of gaining income through labor. This loss of income can result in humans not being able to sustain their living conditions. Furthermore, loss of income can result in less economic spending. Since states levy taxes on income from labor, state income can decrease as a result of AI substitution of human labor. Other aspects like job fulfillment or value a job provides to humans such as an identity, would also be affected when AI substitutes human labor. The Substitution of human labor by AI and automation could have a large societal impact.

The economist Keynes (1930) described industrial-technological change as: *''We are suffering, not from the rheumatics of old age, but from the growing-pains of over-rapid changes, from the painfulness of readjustment between one economic period and another.''*(p. 321). However, this leaves the question of how much growing pains are people willing to condone before action may be deemed necessary?

Recently, one policy solution that comes up in public debate surrounding the future of work is Universal Basic Income (UBI hereafter). The policy of UBI is being popularized by celebrity endorsements like those of Mark Zuckerberg, Andrew Yang, and Elon Musk. Wang (2017) writes that both Mark Zuckerberg and Elon Musk stated the loss of jobs due to automation as their reason for endorsing UBI. Constant (2021) writes that Andrew Yang his push for UBI is due to two main reasons. First, Andrew Yang mentioned predicted advancements in technology affecting human labor. The second reason why Andrew Yang supports UBI is increasing income inequality over the past 40 years (Constant, 2021).

UBI is an individual income paid to all members of a group without requirement (Van Parijs, 2004). UBI is argued to have many benefits in addition to alleviating poverty from technical unemployment, like offering more personal freedom, economic development, and gender equality.

In response to the recent health crisis and economic crisis, governments have enacted policies that universally disperse in-cash benefits to people. These universal in-cash benefits are designed to stimulate the economy from the button-up and allow citizens to decide and fulfill their own needs via market mechanisms. The American government its response to the COVID-19 pandemic were several universal stimulus packages. Law (2020) tells that the two reasons for the American policy were to provide financial needs to lower-income individuals and stimulate the economy. Interest in UBI has been intensified due to the similarities between UBI and the unconditional universal in-cash stimulus packages. Doar and Weidinger (2021) question if these universal cash policies are a trend that will lead to the adoption of a UBI policy. Furthermore, Burman (2020) wonders if a direct cash policy is the most efficient economic tool during a recession. Burman (2020) argues that the direct-cash emergency income targets those most in need while the individual spending may target the needs of the recipients better than government in-kind policies.

Furthermore, universal eligibility would involve less administrative costs (Burman, 2020).

The proposed research seeks to acquire knowledge if and to what extent UBI could alleviate the problems caused by technical unemployment caused by the substitution of human labor. This research aim is operationalized with the main research question: *''To what extent can Universal Basic Income address the challenges brought on by the substitution of human labor in the fourth industrial revolution?''.* To answer this question, this research first seeks to answer the question*:* "*What are Universal Basic Income policies?''.* Next this research seeks to gain knowledge about the challenges of unemployment during technological advances with the question*: ''What are the challenges associated with the substitution of human labor during the fourth industrial revolution?''*. Last, this research looks into the working of the proposed policy with the question: "*What effect does Universal Basic Income have on challenges brought on by the substitution of human labor that are faced by the technologically unemployed?''.*

1.1 Societal relevance

Predicted advances in technology during Industry 4.0 will reshape the way humans live their lives. Advancements in technology can bring many benefits for humans. However, one challenge that advancements in production technology bring is the substitution of human labor. A MIT study from Frey and Osborne (2017) argue that within the next 10 to 25 years, 47% of current forms of employment (in the US) are at risk of being replaced by AI and automation. Woodley of Menie, Figueredo and Sarraf (2019) argue that from a historical point of view, new jobs will eventually be created when demand for labor changes due to technological innovation. However, the process to gain those new jobs can be difficult for the unemployed (Woodley of Menie et al., 2019). Rotman (2013) argues that technology has shown to grow our wealth in the past. However, there is no guarantee everyone will benefit financially from technological advancements in the future (Rotman, 2013). The impact of technology on inequality may already be visible. Rotman (2014) argues that the largest wealth inequality exists in correlation with innovative technology. Nowhere in the United States is wealth more unequally distributed as in Silicon Valley. The median wage in Silicon Valley has reached 94.000 USD while the national median wage in the US is 53.000 USD, (Rotman, 2014).

Past decades have seen limited job growth compared to earlier decades. Brynjolfsson and McAfee (2014) tell of the *''great decoupling''*. In the ''great decoupling'', technology produces a healthy economic growth in productivity but a weak growth in jobs. This means technology is destroying more jobs than technology is creating (Brynjolfsson & McAfee, 2014). This destruction of employment is shown in US labor markets, where for every robot per thousand workers, the employment-to-population ratio is reduced by 0.2% and wages by 0.42% (Acemoglu & Restrepo, 2020). Moreover, both Rotman (2014) and Brynjolfsson and McAfee (2014) argue about the monopolizing effect of technology. Perhaps this monopolizing effect is best illustrated by the following quote from Rotman (2014): *''why use a search engine that is almost as good as Google?''* (Racing Ahead section). Monopolizing technologies leave fewer competitors which can mean fewer employment opportunities.

Economic well-being is one of the most important factors for mental and psychical health. Cooper, McCausland and Theodossiou (2006) argue that employment status is a big predictive indicator for mental and psychical health. Unemployment increases the chance of becoming unhealthy by up to 313% (Cooper, McCausland and Theodossiou, 2006). Moreover, unemployment is related to increased suicide rates (Blakely, Collings and Atkinson, 2003).

The 47% of employment that Frey and Osborne (2017) predict would disappear within the next decades raises many questions for the future. A future where more humans are unemployed

raises many questions for our current way of life. How will individuals cover living expenses without labor as a source of income? How will technology change human lives? How will increased unemployment affect the revenue generated from income taxes to run government institutions or social programs? Advancements in technology will affect the way humans will live their lives and the roles humans fulfill in society.

This research aims to address the societal challenges that come from advancements in technology, specifically societal challenges spawned by the substitution of human labor by advancing technology through researching the policy solution of a UBI.

1.2 Scientific relevance

The future technological developments of industry 4.0 and its impact on the future of work still have unclarities in academic literature. A discrepancy between scientific fields exists in different predictions.

Economists like Mnif, Feki and Abdelkafi (2018) or Arčabić, (2016) and economic historians like Woodley of Menie et al. (2019) generally argue that technological innovation increases gross domestic product (GDP) and causes increasing demand for high skilled employment via the economic theory of compensation. Common economic policy suggestions recommend education to solve the educational gap for new employment (Mnif et al., 2018). Furthermore, the technology oriented sciences by Rotman (2014) and Brynjolfsson and McAfee (2014) argue about the societal effect of technological change in rising inequalities. The focus in regards to technological change of labor market science is on hypothesis of labor polarization by Autor, Katz, Kearney (2008) and price measurements hypothesis by Autor, Levy, and Murnane (2003).

Research focusing on Universal Basic Income (UBI) exists mainly in the scientific fields that focus on social policies. However, some academic literature does connect and reckoned the policy of UBI to the technological change of industry 4.0. Example is Mathers (2019) arguing the rise in the gig-economy by labor polarization renews the social call for UBI. Another example is Kovacs (2018) arguing that technology reshifting the global value chain threatens the fiscal stability of welfare states and thus favoring reform to a policy with less administrative burden like UBI. Rainnie and Dean (2019) argue that the discussions surrounding UBI are a historic trend. The trend of UBI as part of public discussion can be linked to technological industrial advancement affecting employment (Rainnie & Dean, 2019). In addition to social policy scientific focus on UBI, is the support UBI policies enjoy from (prominent figures) outside of academia (see paragraph 1.0).

UBI as a policy idea has several points which might see it gain prominence. Technological advancements can change in socio-economic conditions which foster social change and change in social policies. Examples are the changing conditions of the ongoing labor polarization described by Autor et al. (2008). Or the rising inequality which Rotman (2014) and Brynjolfsson and McAfee (2014) argue is associated with technological advancement. Alternatively, the consequences of the technological advance described by Kovacs (2018) could change conditions by changing the global value chain. The public support that UBI enjoys is one of the external events for forming policy according to the action coalition framework (ACF) designed by Weible, Sabatier and McQueen (2009).

However, currently, research into UBI is predominantly theoretically oriented. Research that does include empirical elements focuses on selective UBI pilots. A large case study gathering data and making comparisons about the effect of UBI is currently not present in academic literature. Neither is an in-depth review of how UBI would affect the changing employment landscape of industry 4.0 present in literature. This knowledge would not only grow the scientific understanding of

UBI as a social policy, but would also better help policymakers to plan for upcoming changes to employment.

1.3 Relevance for Public Administration

Strategic management in public administration focuses on maximizing value within the choice constraints while using sources of support and legitimacy to ensure that public purposes are achieved (Moore, 1995). The impending challenge that Frey and Osborne (2017) predict sees 47% of all forms of employment disappear over the coming decades. This drastic change poses challenges for existing welfare policies. This research aims to explore how public administration can strategically optimize policy decisions for the challenge of substitution of human labor during Industry 4.0.

UBI research asks how much means-tested welfare schemes in public administration are red tape that creates a less efficient bureaucratic system within public administration. The definition of red tape from Bozeman (2000) is *''rules, regulation, and procedures that remain in force and entail a compliance burden but [do] not advance the purpose the rules were intended to serve''* (p. 12). The idea of UBI as a legitimate policy is that UBI would be more efficient for similar goals than current welfare policies. As such UBI can be seen as Offe (as cited in De Wispelaere and Stirton, 2016, p. 5) describes *''an alternative to welfare policy that radically economizes on the administrative overhead costs of fighting poverty''*. The unconditional eligibility of UBI would cut processing costs in public administration as opposed to a means-tested approach to welfare (De Wispelaere and Stirton, 2016). The legitimizing factor for UBI as a policy for public administration use would be if UBI would be more efficient due to UBI reducing costs or if UBI is more effective in solving new problems than the current welfare system. Either legitimizing factor of UBI would improve the output of public goods from a public administration perspective. UBI advocates often claim that UBI is more efficient in dealing with social problems than current government policies. For instance, Muvale and Frankel (2016) argue that a UBI results in a decrease in poverty-related health care expenditures, crime, and opportunity costs in the form of workforce and tax based contributions.

UBI is argued to have advantages over the current welfare state system. De Wispelaere and Stirton (2016) note that within the perspective of UBI policy the current welfare state bureaucracy is seen as controlling. Current welfare systems have been criticized for making a claimant increasingly more passive and subservient with little concern for agency, dignity and self-esteem of the claimant (Handler, 2004). The negative interactions of making a claimant more passive and subservient have well-known motives like prioritizing effectiveness in processing for public administration and enforcing compliance for eligibility (Lipsky, 1984). Welfare systems have even been used as a control mechanism particularly for poorer applicants (Piven & Cloward, 1993). Ávila, Hannah-Moffat and Maurutto, (2021) warn of the danger of technological innovation in public administration. AI developed by machine learning is making its way into the computer systems of public administration. Machine learning uses risk assessment that can create discriminatory outcomes based on statistical characteristics. Risk assessment based on characteristics associated with race would create a system of algorithmically automated racism (Ávila et al., 2021). An example of the algorithmic racial discrimination is the Dutch childcare benefits scandal. During the scandal one of the things criticized was the use of algorithms to assess risk on a racial basis. The use of algorithm to assess risk on the bases of race created a system of algorithmic racial discrimination (Amnesty International, 2021).

Preparation for the technological innovation of industry 4.0 affects multiple facets of public administration. Development planning in public administration would strategically need to adjust in advance of the technological changes of industry 4.0. Herrschel (2013) describes that the staple

current development strategy in (local) public administration is aimed at moving up the value chain. However, Kovacs (2018) tells that the technological advancement of Industry 4.0 will bring changes to value chains that can be dynamic which can lead to revaluations of existing local development.

1.4 Readers guide

The aim of this research is to find answers that help with the challenge of human substitution by technology in the changing labor market during Industry 4.0. This aim is operationalized by exploring the likely challenges and to what degree the well-known policy of UBI would be effective in helping with these likely challenges. This research uses the research question: *"To what extent can Universal Basic Income address the challenges brought on by the substitution of human labor in the fourth industrial revolution?"*

This research will first delve into the academic literature about the technological change of Industry 4.0 and how the technological change affects humans. The academic literature covered in chapter 2 of this research will predominantly focus on changes in the labor market and the popular policy of Universal Basic Income that is commonly argued to help with these labor market changes. After that, the methodology of the comparative case study for this research will be discussed in chapter 3. Next, chapter 4 gives answers to the sub-research questions this research asks. After that, chapter 5 will have a conclusion of the research as well as discuss the implications for future research and policy strategy. Lastly, Appendix 1 gives a comprehensive description of each UBI policy case that was studied for this research.

2.0 Literature review

This chapter will survey contemporary academic literature about predicted technological change and Universal Basic Income. The goal of this literature review is to gain a better understanding of both the substitution of human labor in Industry 4.0 and the popular policy solution of Universal Basic Income (UBI). First, this chapter will make a general exploration of the academic literature about the effects of technological advancement. Next, this chapter will focus on the specific aspect of substitution of human labor and will look into the predicted substitution as well as the consequences of substitution. After that, this chapter will delve into the academic literature about UBI. Lastly, there will be a conceptual framework that shows the relationship between elements of academic literature that are expected to be found in this research.

2.1 Industry 4.0: challenges and opportunities

The term Industry 4.0 stands for the fourth industrial revolution. The term was coined at the Industrial Trade fair in Hannover in 2011 and has been popularized by the World Economic Forum since 2016 (Pfeiffer, 2018). Vaidya, Ambad, and Bhosle (2018) explain that Industry 4.0 is a future perspective of currently developing technologies like Artificial Intelligence (AI), cyber-physical systems (CPS), the Internet of Things (IoT), and how those technologies will affect the many facets of our society, work, and personal lives in the future. Dhanabalan and Sathish (2018) argue the general way these technologies add value is by creating a faster and more efficient process for tasks. The application of these new technologies would increase efficiency in many sectors. Roberts et al. (2020) argue these increases in efficiency can have a trickle-down effect on the economy. Advancing technology increases efficiency from the manufacturing sector to the service industry, and as such advancing technology increases overall GDP (Roberts et al., 2020). Furthermore, Roberts et al. (2020) argue that the market for these developing technologies is large. For example, the market for AI is estimated to be a 150 billion dollar industry (Roberts et al., 2020). Dhanabalan and Sathish (2018) write the technological advancements of Industry 4.0 also offer benefits for the public sector, specifically public health, education, energy and defense, but also for general utility purposes.

2.1.1 Macro-economic effect of technological innovation

Effects of technological innovation on business cycles differ from demand-driven effects on business cycles for unemployment and economic growth. Arčabić (2016) argues that technological shock on business cycles has long-term positive effects on productivity as opposed to non-technological shocks. However, Arčabić (2016) notes the effect on productivity is negatively correlated to employment. Meaning, as processes become more productive after a technological shock, less employment is needed. Moreover, Arčabić (2016) argues unemployment during technological shocks on employment negatively correlates with GDP while having a positive correlation with GDP during business cycles. Meaning, during an industrial revolution GDP continues growing even if unemployment increases (Arčabić, 2016). Ferraresi, Roventini and Semmler (2019) argue similarly to Arčabić (2016) that technological shock grows productivity and GDP but reduces employment. However, where unemployment from technological shock differs from business cycles unemployment, is in the type of unemployment technological shock causes. Both Ferraresi et al. (2019) and Furkanetto, Sveen and Weinke (2019) argue that unemployment due to technological shocks compared to unemployment during business cycles affect the termination of specific employees (extensive margin) rather than general hours worked (intensive margin).

The supply and demand in the job market are not static, but supply and demand are ever-changing. Mnif et al. (2018) argue based on the economic theory of compensation that technological innovation terminates unskilled labor in one sector but creates more demand for unskilled labor in other sectors. This change in demand of unskilled labor is known as the replacement effect. Furthermore, advancements in technology change the demand for skilled labor in sectors that require different qualifications. This change for skilled labor is known as the compensation effect (Mnif et al., 2018). The technological oriented labor market change that Mnif et al. (2018) describe differs from business cycle driven labor market change. Pavlidou, Tsaliki and Vardalachkis (2011) argue that growth of unemployment based on business cycles and subsequent employment growth is primarily based on low skilled temporary employment. This differentiates unemployment by business cycle shock from technological shock by the effect on low skilled workers. Mnif et al. (2018) describe the difference between employment skill levels during technological unemployment. Mnif et al. (2018) argue that during technological driven labor market changes low skill employment opportunities cease to exist and qualification requirements for employment opportunities change. As such, the structural unemployment that is caused by technological unemployment persists by a gap in qualifications to gain new employment, but the ability to gain new employment may also be hampered by geographical or professional adaptive mobility Mnif et al. (2018). Kergroach (2017) argues that employees need a new set of skills as a result of developments in AI. Kergroach (2017) predicts that instead of highly specialized knowledge which used to drive an employee its career for decades, future employees will need personal skills, such as management skills, and will need to update their professional knowledge skills every few years.

In the aforementioned compensation effect by Mnif et al. (2018), technology-oriented jobs and jobs in technology firms are predicted to be in higher demand after technological innovation. Similar employment changes in technology-oriented jobs are argued by Kapeliushnikov (2017) and Calvino and Virgillito (2017). Kapeliushnikov (2017) and Calvino and Virgillito (2017) argue that firms investing in technology see employment growth within the organization. Herstad and Sandven (2019) elaborate on the employment growth with firms. Herstad and Sandven (2019) argue that firms that increase employment due to innovation only do so due to long term strategy based on R&D investments, wage expenses, sales performances, and strategic management of cumulative organizational learning. However, Turner, Mitchell and Bettis (2013) argue that once firms start reducing employment this reduction leads to an accelerating effect of cutting more employment in the future. Similar to Turner et al. (2013), Bogliacino, Lucchese, Nascia, and Pianta (2016) describe cutting employment for technology induced efficiency as entering a vicious cycle with feedback loops of cutting more employment.

Little is known about the effect of technological change at industry level. Calvino and Virgillito (2017) argue that technological innovation in one firm might often hinder job displacement at industry level. As competitive market dynamics cause sector-wide adoption of innovation. Technological innovation and subsequent improvement of products often drive employment growth at sector level. Calvino and Virgillito (2017) argue that productivity-enhancing innovation reduces the demand for specific labor. However, competitive market dynamics can cause market-wide adoption of technologies and thus hinder job displacement (Calvino & Virgillito, 2017). Technology can also have a monopolizing effect (Rotman, 2014; Brynjolfsson & McAfee, 2014). Monopolies are known to be less competitive. It is unknown whether a monopolizing effect can negate the competitive market dynamics that hinders job displacement.

While job demand in the technology sector might increase however many areas lack a technology sector. Developing countries lag behind in the development of technological advancements (Dhanabalan & Sathish, 2018). This lagging behind leads to developing nations mainly importing technological innovation (Mnif et al., 2018). Mnif et al. (2018) argue that developing

nations differ from the economic theory of compensation with positive short-term effects on employment and negative long-term effects on employment. Regions or countries that are importers of technology can have negative long-term employment effects of technological shock on employment (Mnif et al., 2018). The geographical mobility gap to gaining new employment argued in Mnif et al. (2018) might become a particularly relevant gap in areas without a technology sector. As an unemployed may need to move or emigrate for new employment opportunities.

While demand for technology-related employment is argued to rise, demand for other types of occupations is also argued to increase. Mokyr, Vickers, Ziebarth (2015) argue that technological development does not spell the end of humans working. Rather, technological developments affect how work is done. Work is likely to revert back-to patterns before factory work. Work will become more flexible, and this flexibility will change work-life balance (Mokyr et al., 2015). Autor (2001) argues that during peak growth in the technology sector, employment went up in contrast to consultancy. Which indicated growing sectors will offer stable employment while other sectors might offer more flexible employment (Autor, 2001).

Increased flexibility in employment has many aspects in which it differs from regular employment. Goldin (2014) notes that inflexible employees have greater gender equality in earnings compared to more flexible employment. However, increases in flexibility can also serve as a backdoor to get more effort out of employees (Goldin, 2014). Mokyr et al. (2015) note that the usage of temporary employment creates uncertainty for the employee in the number of working hours and thereby the employee his income. This uncertainty in income can be a backdoor for the employer to gain more effort out of a flexible employee.

2.1.2 Employment likely to be affected by technological innovation

General lines in the academic literature point towards certain forms of employment being affected by future technological shock on employment in the coming decades. Predictions are mostly based on three factors: how repetitive the work is, the level of skills required, and the comparative cost of automation.

The factor of skill level as a predictor for technological unemployment stems from how skill level affected employment during the third industrial revolution. Manning (2004) argues that during the third industrial revolution, technological advancements mainly affected the demand for cognitive low-skill jobs and not physical low-skill jobs (Manning, 2004). Aaronson and Phelan (2017) argue that recent technological innovation has shown little effect on low-skilled jobs. Aaronson and Phelan (2017) note wages for low skill jobs remained stable and that low skilled employees that lose employment are able to regain employment relatively fast. However, Aaronson and Phelan (2017) argue that the coming technological advancements will replace low-skilled cognitive jobs. But the loss of employment of low-skilled cognitive jobs will be offset by the creation of low-skilled physical jobs (Aaronson & Phelan, 2017). Autor et al. (2003) argue that although this increase in demand for physical low-skilled jobs may be growing, this increase is strongly linked to the physical proximity to more skilled labor. Furthermore, Autor et al. (2003) add that the low-skilled cognitive jobs may be vulnerable to further technological developments in the future. However, Autor and Dorn (2013) argue that when technology substitutes human labor, employees may also face competition from higher skilled peers. A situation may develop where a lack of middle-skill jobs may see middle-skilled employees competing with low-skilled employees for low-skilled jobs (Autor & Dorn, 2013). However, low-skilled education in vocational training would likely still have benefits for employability. Pfeiffer and Suphan (2015) argue that vocational training increases the labor capacity of low-skilled workers which in turn increases the employability and means of making a living of low-

skilled workers. For a comparison in employability the labor capacity index of a person with no qualification scores is on average 0.38, compared to the average score for vocational training of 0.54 (with an average of score 0.64 for technicians) and the average score for an academic degree of 0.61 (Pfeiffer & Suphan, 2015).

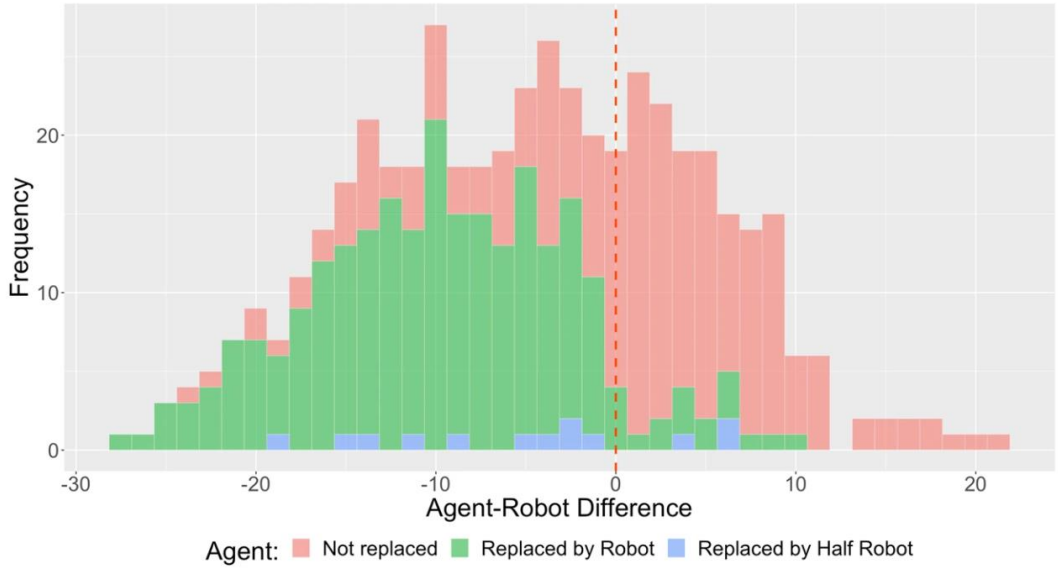
Repetitiveness and skill level are seen as factors in the prediction for which forms of employment will be substituted during industry 4.0. An example of a skill-based prediction comes from Cox (2021) who focuses on the employment forms in higher education. Cox (2021) argues that AI will assist teachers, and not replace them. Picciano (2019) adds that many full-time supporting staff positions will disappear. Picciano (2019) bases the argument about the disappearance of supporting staff positions on the events of the third industrial revolution. Picciano (2019) tells that during the third industrial revolution the substitution of human labor affected lower-skilled and middle-skilled cognitive employment forms that had a supporting role. Picciano (2019) notes that the technological changes of industry 4.0 do not spell the end for overall middle-skilled employment. In spite of Autor (2015) arguing that many middle-skill jobs will disappear as a result of AI adaptation. However, Autor (2015) also argues that middle-skill jobs which require "middle-skill" mathematics, life sciences, and analytical reasoning will not be substituted by technology. Examples of these occupations that will persist are medical support occupations, skilled trades and repair occupations, and automotive technicians will have jobs for the decades to come. Additionally, jobs that rely on literacy, numeracy, adaptability, problem-solving, and common sense will also persist in the coming decades according to Autor (2015).

The price measurement hypothesis by Autor et al. (2003) states that task routinization and price measurements in cost-efficiency dictate the substitution of human labor by technology and has been widely adopted in academic literature. Autor et al. (2003) state that the reasoning behind the price measurement hypothesis is based on the historical precedent of past industrial revolutions. Autor et al. (2003) argue that technological innovation reduces the price of machines capable of performing similar (routine) tasks to human laborers. The lowering price in turn reduces the demand for humans by increasing demand for machines (Autor et al., 2003). Routinization in price measurement hypothesis from Autor et al. (2003) is broken down into a dichotomy that distinguishes between routine tasks (cognitive and manual) and non-routine tasks (analytical and interactive). Autor et al. (2003) argue routine tasks are more susceptible to substitution by automation and AI. Whereas technological innovation for the non-routine task was more likely to be complementary (Autor et al., 2003). Pfeiffer (2018) notes Autor et al. (2003) give several examples of routine and non-routine tasks. With one notable example that Autor et al. (2003) give of a non-routine task which computers would have limited opportunities to impact being self-driving cars. Pfeiffer (2018) argues the real nature of the routine or non-routine dichotomy does not refer to people describing or experiencing certain jobs as monotonous and lacking in variety. However, Pfeiffer (2018) argues the true nature of routine tasks is whether or not technology has progressed so far as to completely take over the task.

There is only limited evidence that cost efficiency affects human employment when competing with automated systems. Cabrales, Hernández and Sánchez (2020) argue that while cost efficiency does play a role in labor substitution the employee well-being after substitution also affects substitution rates. Furthermore, evidence contrary to the price measurement hypothesis suggests that workers that are more productive than automation can also be substituted (Cabrales et al., 2020). Figure 1 shows the frequency of human substitution by robots compared with the comparative efficiency of humans and robots (with robotic efficiency being the zero point) and the substitution of human employees being represented with the color green. Although figure 1 shows a trend that is similar to the price measurement hypothesis of Autor et al. (2003). However, figure 1

also shows a divergence of the workplace efficiency trend due to not all inefficient employees being substituted by automation whilst more efficient employees are substituted by automation.

Figure 1: Worker replacement in comparison to productivity

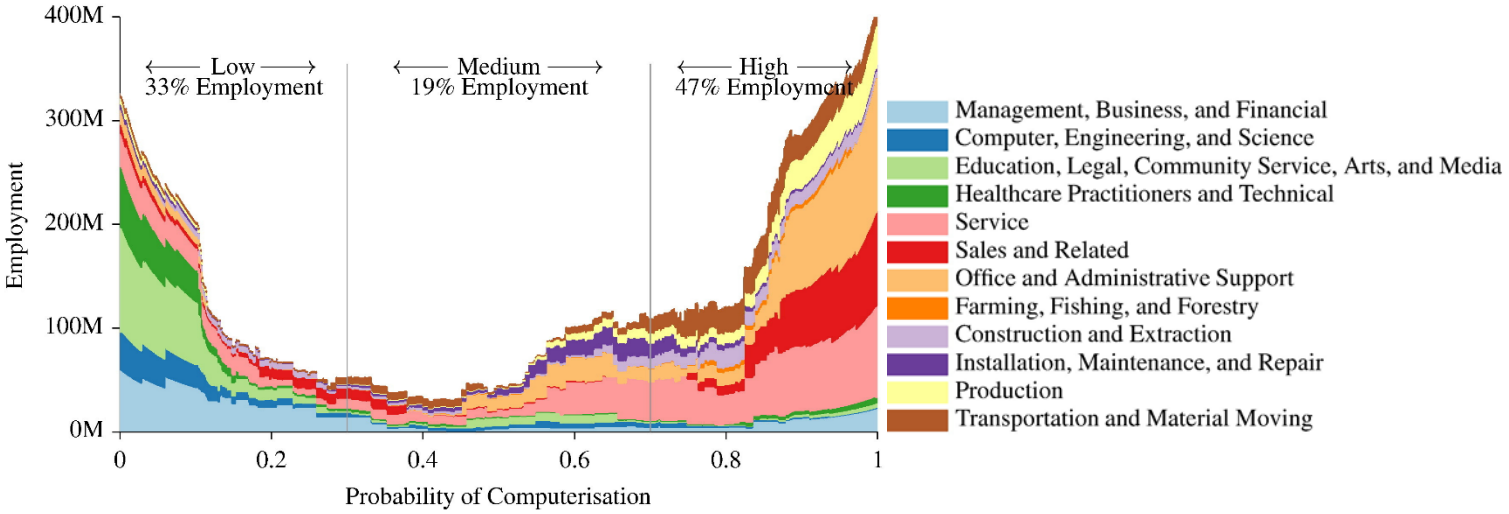


Taken from Cabrales et al. (2020)

As mentioned above, Pfeiffer (2018) argues that the routinization dichotomy in the price measurement hypothesis correlates more to the technological ability to automate tasks rather than the routinization of the work. Looking at the variables that bottleneck computerization, Frey and Osborne (2017) predict 47% of current employment forms are at risk of being substituted by AI and automation within the next two decades. Frey and Osborne (2017) base the predicted substitution of employment forms on the bottlenecking variables of perception and manipulation of objects, creative intelligence in originality and arts knowledge, and social intelligence in perceiving reaction and responding (Frey and Osborne, 2017). See figure 2 for a visual representation of the types of employment and the associated probability of substitution by computerization that is argued by Frey and Osborne (2017). Figure 2 shows that employment sectors like the service industry, sales, manufacturing, transportation, construction, and office and administrative tasks have a particularly high risk of being substituted by AI or automation. Figure 2 shows employment in sectors like education, healthcare, management business and finance, computer engineering and science have a low chance of being replaced by AI and automation in the coming decades.[1]

[1] For a comprehensive list of 702 types of employment and their relative risk for substitution by AI and automation see appendix 1 of Frey and Osborne (2017).

Figure 2: Probability of Computerization



Retrieved from Frey and Osborne (2017)

Although technological advancements may pass bottlenecks, other factors still exist that limit the substitution of human employment. Baxter, Rooksby, Wang, and Khajeh-Hosseini (2012) argue the irony of automation is that the more the dependency on technology grows and technology is pushed to its limits the higher the demand for highly-skilled, well-trained and well-practiced humans becomes to make the automation systems resilient. Highly skilled workers act as the last line of defense against the failures that will inevitably occur within the automated system (Baxter et al., 2012). Pfeiffer (2018) notes that the data of Frey and Osborne (2017) groups together several professions of one industry. The grouping of professions has advantages for data collection but the grouping together of professions also has downsides (Pfeiffer, 2018). Pfeiffer (2018) notes Frey and Osborn (2017) use near-certain probability for computerization of manufacturing work when scoring most manufacturing machine-related work with a probability of 0.9 or higher. Pfeiffer (2018) argues that the data of Frey and Osborne (2017) groups togethers machine operators and setters which have different skill levels with different chances of substitution by computerization. Even if cyber-physical systems (CPS) improve, CPS cannot function without machine setters but might need fewer machine operators (Pfeiffer, 2018). Pfeiffer (2018) argues the role of machine operators in these environments will change to become robot supervisors. The job of machine operator after Industry 4.0 will consist increasingly of intervening in the production process which requires task specialist knowledge about programming robots, knowledge concerning quality control and organizational learning (Pfeiffer, 2018).

In addition to the need for human supervision and repair, social, creative and legal factors may prevent substitution of human employment. Kim, Kim and Lee (2017) argue creativity (something which machines do not possess) and legal and social regulation will curb the 47% of employment substitution Frey and Osborne (2017) foretell. Using linear probability-based analysis via Markov chains Kim et al. (2017) argue that as time passes occupations will crossover between susceptibility and non-susceptibility to computerization based on social and legal factors. Kim et al. (2017) give as an example of limiting automation due to social and legal factors that governments can choose not to computerize their administration as part of a welfare effort. Kim et al. (2017) argue that long-term models like that of Frey and Osborne (2017) assume social, legal and dexterity occupational requirements remain stagnant. However, no model can predict which jobs appear after technological advancements, while many of our current jobs exist only because of technological advancements made in previous industrial revolutions. It is thus highly likely that new technology-

friendly jobs that coexist with new technologies will appear (Kim et al., 2017). Rotman (2013) notes similar changes due to technology have happened with employment in other sectors. Rotman (2013) gives the example that the agricultural sector made up 41% of US employment in 1900 and by the year 2000 employment in agriculture was reduced to 2% due to technology. Likewise, Rotman (2013) argues that post-world war II the manufacturing sector contained 30% employment and by 2013 this was reduced to 10% partly due to automation advancements in the 1980s.

Different technologies of Industry 4.0 will have differing effects on employment. Pfeiffer (2018) argues CPS and IoT are likely to change the role of humans from machine operators to problem solvers. Sima, Gheorghe, Subić, and Nancu (2020) argue that mainly digitalization, information technology, and communication technology are changing the corporate landscape. Martiskova and Svec (2019) argue human labor will not disappear, to the contrary, some employees may benefit from the advancements in technology. Martiskova and Svec (2019) argue that humans with the rare talent capable of creating the analytical algorithms needed in the future for production after the fourth industrial revolution will benefit in the labor market from the technological advancements.

2.1.3 Physical and psychological effect of technology on (un)employed

Technological unemployment or adjusting to technologies can have several psychological effects on people.

The increase of interaction between humans and machines is likely to decrease human-to-human (H2H) interaction. Dombrowski and Wagner (2014) argue that while Industry 4.0 focuses on enhancing humans in the working environment in human-hybrid systems the human role in these systems could feel subservient. The human in human-hybrid systems has less oversight and thus machined guided execution can feel less predictable and hieracial which causes stress (Dombrowski & Wagner, 2014). Contrary to this Ghislieri et al., (2018) argue that new robotic technology faces the challenge of becoming, not just an accepted, but trusted part of the human team. However, Ghislieri et al., (2018) note that the decrease in H2H interaction can have potentially negative effects on informal learning, organizational commitment, motivation and the well-being of employees.

Technological advancements do not only affect human-to-machine (H2M) interactions but can also affect the relationships between individual humans. For instance, Derks, Van Mierlo, and Schmitz (2014) argue previous advancements in communication technology like smartphones or laptops have affected employees during leisure time. The changing relationship between humans during leisure time has affected the well-being and work-life balance of employees (Derks, et al., 2014). Similarly, Turel, Serenko and Bontis, (2011) argue the use of technology at work is intertwined and correlates with usage of technology at home. Higher levels of usage of technology that are classified as addiction can increase perceived workloads and lead to technology-oriented family conflicts (Turel et al., 2011). Quinones, Griffiths and Kakabadse (2016) note some employees (predominantly men) are positive about work-life interference. Quinones et al. (2016) argue that the work-life interference confirms the importance of the work of the employee. Although when work-life interference happens too frequently the positive view of interference is replaced by a negative view (Quinones et al., 2016).

Employees that lost their employment due to technological innovation face different challenges than adjusting to the new technology. Blustein (2008) argues work plays a central role in the development, expression, and maintenance of psychological health. Schöb (2012) argues that initially unemployment primarily threatens an individual worker their identity rather than the sustainment of an worker their lifestyle. Picciano (2019) gives the example of a highly skilled

professional who dedicated his career to certain skills and was being outclassed by newly innovated AI. Being outclassed by machines in tasks which require years of dedicated practice can give a (former) employee a melancholic loss of purpose (Picciano, 2019). Loss of identity will be one of the first challenges an unemployed person faces.

However, loss of work can also have negative effects on the physical health of the unemployed. Bartley (1994) argues unemployment is not only associated with financial worries but also with ill health and higher rates of mortality. Bartley (1994) argues that the four main causes of ill health and higher mortality are relative poverty, social isolation, loss of self-esteem and negative health-related behavior (e.g. increased smoking and drinking). Cooper, McCausland and Theodossiou (2006) argue similar negative physical and mental health effects from unemployment. Cooper et al. (2006) adds an unemployed person is between 22% and 313% more likely to end up in bad health. McKee-Ryan, Song, Wanberg, Kinicki (2005) argue the main causes of mental health problems for the unemployed insignificantly correlate with the generosity of welfare grants. The biggest correlation for mental health problems during unemployment is related to the duration of unemployment and whether the unemployed is an adult or school dropout. With both a longer duration of unemployment and school dropout status negatively affecting the mental health of an unemployed (McKee-Ryan et al., 2005).

Another negative effect associated with unemployment is earlier mortality with increased suicide rates. Pompili et al. (2010) argue existing mental problems and alcohol usage often co-morbid while job loss may increase alcohol consumption. Increased alcohol consumption can lead to a feeling of hopelessness, loneliness, and social isolation. The feelings induced by increased alcohol consumption may lead to depression or suicidal behavior (Pompili et al. 2010). Similar findings on the importance of employment status were made by Taylor, Page, Morrell Harrison and Carter (2005). Taylor et al. (2005) argue that many factors contribute to significant suicide risk increases, like mental health issues, anxiety (females only), substance abuse, and depression (males only). However, Taylor et al. (2005) argue that the factor of unemployment increases the risk of suicide more than other variables. The risk of suicide correlates stronger with only the variable of unemployment rather than unemployment in combination with mental health (Taylor et al, 2005).

The risk of mental problems increases particularly during times of economic hardship. Pereira (2015) argues people with remitted mental health problems have a high risk of being mentally affected by the economic downturn. However, even when remaining employed Lee et al. (2010) and Wang et al. (2010) argue that an economic downturn still increases the risk of depression. Meltzer et al. (2010) argue the increase in mental health problems for the employed during an economic downturn is due to job insecurity. Furthermore, Angermeyer et al. (2013) argue that the increase of mental problems for employed workers is due to loss of hope and faith in the future. Relapsing mental problems due to an economic downturn can be worsened when the employed loses its income. As such, income loss creates a vicious cycle that makes gaining new employment more difficult (Angermeyer et al., 2013). As such mental health problems can be a barrier to gaining new employment. Viinamaki, Koskela, Niskanen, Arnkkill and Tikkanen (1993) argue that during times of financial hardship, men are more affected by poorer mental health. Additionally, Pompili et al. (2014) argue that the risk for suicide due to financial hardships is higher for men than women. Moller-Leimkuhler (2003) argues that this higher rate of suicide for men is due to the pressure of failing to fulfill the traditional masculine beliefs of being a provider for the household.

2.1.4 Which solutions does academic literature propose?

Scientific literature proposes several measures to address challenges predicted to be caused by the technological advancement during Industry 4.0.

According to Mnif et al. (2018) the technological changes cause a changing occupational landscape which requires future employees to have new qualifications. The changing occupational landscape suggests education to help both employees and employers to bridge a qualification gap (Mnif et al., 2018). Bonekamp and Sure (2015), Kergroach (2017), and Sima et al. (2020) argue continued learning, training, and education are needed for the growing complexity and demand of high-skilled occupations.

Furthermore, as a result of the technical developments of Industry 4.0 changes in the labor market are predicted to occur. Due to the changes in the labor market Bonekamp and Sure (2015) argue a change in the taxation system is needed to make the taxation system less reliant on tax income from labor. Bonekamp and Sure (2015) argue that negative tax rates, increasing VAT taxes, or guaranteeing a Universal Basic Income (UBI) are possibilities for making a taxation system less reliant on labor. UBI has been popularized as a financial buffer method during periods of shocks on employment (Perkins, Gilmore, Guttormsen & Taylor, 2021). Additionally, Hamilton and Martin-West (2019) argue UBI shows improved educational results for children whose families received UBI. Pfeiffer and Suphan (2015) note improved educational results may increase future workforce capabilities.

Kim et al. (2017) argue that government action is likely to prevent technological unemployment. Kim et al. (2017) suggest government intervention can prevent unemployment by for instance choosing not to computerize public administration.

UBI is suggested by some academic sources as a policy solution. Rainnie and Dean (2019) argue that rising unemployment in combination with further fears of future substitution of labor give way to a public debate of some form of UBI. As the topic of UBI has come up in public debate multiple times during periods of technology-driven industrial change (Rainnie & Dean, 2019). Mathers (2019) argues that the rise in the gig economy has led to renewed calls for a UBI policy. Kovacs (2018) argues that Industry 4.0 will dampen the global wage-based competition. As productivity will rise due to technology the prices of products produced by technology will decrease and thus overall real wages can decline. The dynamical transformation of the global value chain during Industry 4.0 threatens the fiscal sustainability of generous welfare states such as seen in Europe. In the scenario of a new global value chain the possibility for UBI in a new digital age arises (Kovacs, 2018).

Robot taxation to reduce worker substitution is also discussed in academic literature. Zhang (2019) argues robot taxation accelerates the substitution of workers especially for unskilled workers. Contrary to the view of Zhang (2019), Cabrales et al. (2020) argue that robot taxation is effective to deter employers from automating some jobs while UBI can protect workers that would still get substituted by technology.

Kim et al. (2017) explore labor sharing ideas inspired by Vardi (2012). Kim et al. (2017) discuss that working hours can be reduced to employ more employees which creates more part-time employment rather than unemployment. Kim et al. (2017) reason that lowering the retirement age allows younger employees to gain or retain employment and would have a similar effect to sharing labor. However, Kim et al. (2017) argue sharing labor has no economic incentive for employers. Kim et al. (2017) reason that sharing labor multiplies the number of employees that need training. Moreover, forcibly reducing work may provoke dissatisfaction from workers. Furthermore, laying off experienced older workers forces companies to expand resources for training younger but less experienced employees (Kim et al., 2017).

Universal Basic Income offers an interesting perspective from the academic literature for the challenges of technological advancement. The popularity in general discussion and academic sources views UBI as a viable policy solution for the challenges of Industry 4.0. Such as, the effects of increasing educational gain may help for the increased educational requirement due to technical advancement. Additionally, possibilities for taxation reform and fiscal sustainability are possible benefits of the policy.

2.2 Universal Basic Income

In times when (looming) technological change that can impact employment, discussion of a Universal Basic Income (UBI) policy tends to occur (Rainnie & Dean, 2019). UBI is defined as a transfer that is provided universally, unconditionally, and is in-cash paid by the government to every member of society (Ghatak & Maniquet, 2019). Gentilini, Grosh, Rigolini, and Yemtsow (2021) define UBI by the characteristics of universal policy targeting, unconditionality and in-cash transfer modality of the UBI payout. The commonly used definition of UBI by Van Parijs (2004) is: *"A basic income is an income paid by a political community to all its members on an individual basis, without means test or work requirement."*(p. 2). Van Parijs (2004) argues that UBI can be seen as financial compensation for a reduction in working time that contributes to a more equitable allocation of the resources in the economy. Van Parijs (2004) tells UBI can be used as a distribution policy to share specific profits of e.g. economic systems or natural resources. Or UBI can be used as a redistributive policy that is funded alongside other government means (Van Parijs, 2004).

The characteristics of UBI have advantages and disadvantages that are discussed in academic literature. Bidadanure (2019) argues that the characteristic of in-cash benefits allows the recipients the freedom of more targeted spending and saving of UBI compared to in-kind policies. Downside of in-cash benefits are less control over spending and possible squandering of the UBI spending by the recipients (Hamiton & Martin-West, 2019). Furthermore, in-cash policies have economic multiplier benefits and are crucial for poverty alleviation for households without any form of income (Nygård, Lindberg, Nyqvist and Härtull 2019). However, in-kind policies can be more efficient spending from a government perspective (Chzhen, 2017). The UBI characteristic of individuality has the advantage of granting every household member an individual income (Bidadanure, 2019). Bidadanure (2019) argues an individual UBI would empower non-breadwinner members of the household. However, Gustman et al. (2012) argue inter-household equality would decrease as individual benefits do not address inter-household wealth inequality. The UBI characteristic of unconditionality has several advantages. Bidadanure (2019) argues that unconditionality separates the obligation of work from the right to an income. Ghatak and Maniquet (2019) argue unconditionality removes the stigma associated with requesting aid. Hanna and Olken (2018) argue that conditional welfare programs have shown that richer households are able to meet eligibility criteria more often and benefit more from welfare policies. Lazar (2020) argues that providing UBI unconditionally allows for long-term planning and gives employees more power in the relationship with their employer.

The perspective of UBI as a policy differs greatly between political groups. Delsen (2019) notes that discussions surrounding UBI tend to correlate with economic downturns. However, Banerjee, Nieuhaus and Suri (2019) note that recent UBI discussions contain ideas of welfare-state reform. The paradox of UBI is that demand mainly exists in places with strong welfare states and little budget for a UBI policy (Parolin & Siöland, 2019). Arguments in favor and against UBI differ based on political perspective. Schwander and Vlandas (2020) argue left leaning citizens may find UBI appealing for the characteristics of equality and redistribution. Political left finds UBI appealing for

the personal freedom that unconditional individual benefits bring (Schwander & Vlandas, 2020). Schwander and Vlandas (2020) note UBI can appeal to libertarians due to the perspective of freedom and social investment. However, concerns of inefficiency of UBI can reduce libertarian support for a UBI policy (Schwander & Vlandas, 2020). Zimmermann et al. (2020) argue the main dislikes political conservatives have about a UBI policy are potential policy inefficiency, lack of reciprocity and possibility for free-riding. Finally, views in academic literature differ on the idea if UBI should be a distributive or a redistributive policy (Fouksman and Klein, 2019; Mather, 2019).

Questions about the usage, effects and effectiveness of UBI exist. The economic impact of UBI is narrowly discussed in academic literature. Hamilton and Martin-West (2019) argue a UBI policy has no inherent economic effect or that a UBI policy that runs a budgetary deficit by borrowing money would grow GDP. Furthermore ambiguity exists about the labor supply response to a UBI policy. Widerquist (2005) argues that no large labor supply response occurs during UBI policies and that the small labor supply responses that do occur can be seen as people improving work-life balance. Considering the legitimacy of UBI policies Ghatak and Maniquet (2019) argue that the goals and framing of UBI must match the empirical situation. A high information governmental tax system legitimizes UBI based on efficiency in poverty eluviation. To the contrary, a less data driven system could legitimize a UBI policy for egalitarianism. Moreover, systems with imperfect or falsified information can use UBI policies to avoid corruption (Ghatak & Maniquet, 2019). Lastly, implementation of UBI is only narrowly explored in academic literature. De Wispelaere and Stirton (2016) note that while UBI advocates view implementation as a transmission belt that only needs to be politically approved before distribution. Additionally De Wispelaere an Stirton (2016) note that UBI-advocates often argue for a digital system to distribute UBI payments. However, De Wispelaere and Stirton (2016) argue that technology-based distribution is not accessible to all people and changes in the welfare system inherently affect the poorer people who are more reliant on the welfare system.

2.3 Conceptual framework

The advancements in technology of Industry 4.0 is predicted to affect many facets of life over the coming decades. One of the facets likely to be affected is employment. Technology has the general effect of substituting human labor. Substitution of labor can form challenges for the unemployed employee. Unemployment during an industrial revolution is centered on production industries where the production efficiency is increased by technology. The technological shock on employment is expected to affect employed with certain characteristics and is more likely to affect extensive margins (i.e. positions) rather than reduce working hours. Different skill levels of employment face different challenges from different technologies. Lower skilled employees can be substituted by Cyber-Physical Systems (CPS) and middle-skilled employees with a supporting role are predicted to be substituted by AI. However, demand for occupations with middle-skill creative and problem-solving skills is likely to remain. A reduced demand for high-skill employment is also possible due to AI affecting professions like accounting and cyber-physical systems affecting professions like surgeons. Although technological advancements in high-skill occupations are more likely to be complementary rather than to substitute high-skill professions. Still, the demand for high-skill professions may change. Furthermore, the precise impact on jobs can be impossible to precisely foretell due to the volatility in technological development, government actions and future shifts in demand. Moreover, effects of technological advancement are likely to differ between countries and areas based on what variety of economic activities exist.

Academic literature discusses how employment will be affected during Industry 4.0. The

price measurement hypothesis predicts the substitution of workers is largely based on task-based cost efficiency of technology. However, substitution does not mean the end of human employment but a change in demand. The replacement effect of the compensation theory predicts that unemployed low-skill employees will find new employment relatively quickly. However, the new forms of low-skill employment will be increasingly more physical and less cognitive work. Moreover, low-skill employees may face competition from higher-skilled unemployed in the labor market. As middle and high-skill technical unemployed workers require training to find new employment on a similar skill level. New forms of employment that coexist with the new technologies will develop which will match the newly evolved demands after technological advancements. Moreover, the new forms of employment will surround technological forms of employment but these employment forms may not develop in certain areas.

Workers face several challenges due to technological changes of Industry 4.0. Workers need to adapt to advancing technologies that will be increasingly present in the workplace. The work experience of workers can change towards machine supervisors that need comprehensive knowledge of the production process and the organization. Alternatively, the work experience could feel more like taking orders from machines without knowing the underlying reasons. Moreover, machines will increasingly be present in the home environment and adapting to the new home technologies can cause conflicts in the home environment. Above mentioned challenges for workers can cause psychological stress on employees. Workers that lose their employment face challenges of finding new employment to retain their standard of living. Additionally, unemployment correlates with increased risk of mental health challenges and increased risk of ill physical health. Mental and physical health challenges that unemployed workers face can be a barrier for gaining new employment. Moreover, higher skilled unemployed workers face an educational gap to gain new higher skilled employment.

Academic literature proposes different policy solutions to the challenges of Industry 4.0. Universal Basic Income (UBI) offers perspective for poverty alleviation and possible educational gains. UBI is often defined through the characteristics of universality, unconditionality, the transfer being to individuals and the transfer being provided through in-cash payouts. These characteristics of Universal Basic Income differentiate UBI from means tested, conditional, and households based welfare programs or in-kind policies for poverty alleviation.

Research into UBI policies will focus on policy effects for alleviating poverty caused by unemployment. Furthermore, gaining employment for medium-skill and high-skill unemployed requires crossing a skill gap. Educational gains are relevant for gaining employment after technological shock on employment and for this research. Unemployment causes negative physical and mental health effects. These negative health effects can cause barriers for unemployed people when trying to gain employment. As such, the effects of UBI on mental and physical health are relevant for this research.

3.0 Methodology

Chapter 3.0 describes the methodology used and the methodological considerations made. First, the research aim is restated after new insights were gained from the academic literature. Next, the strategy to accomplish the research aim will be discussed. The strategy will be followed up by the research questions. After the research questions, the case selection and reasoning behind the selection is depicted. Next, elements concerning reliability and validity of the comparative case study of this research will be discussed in paragraph 3.5. Thereafter, a section is presented about how this research will collect, handle and analyze data of the different cases that will be studied. At the end of chapter 3 there is a section about the conceptualization and operationalization about the differences between the cases studied in the comparative case study.

3.1 Research aim

This study aims to explore the contemporary viewpoint of Universal Basic Income as a policy solution to the different challenges brought on by the substitution of human labor due to innovation of the fourth Industrial revolution.

3.2 Strategy and design

Theoretical research has been done into UBI and the effects of cases of UBI have been argued in academic literature based on singular UBI experiments. However, no broad empirical comparative case study has been done to examine and compare the effects of Universal Basic Income. Neither have studies gone into a detailed specific situation of Universal Basic Income as a policy solution to the substitution of human labor during the fourth industrial revolution and the challenges that spring from the substitution of human labor. This study aims to uncover the effects of UBI policies to find possible applications for challenges related to human substitution due to technological advancement made during Industry 4.0.

Based on academic literature about the challenges of substitution of human labor this research aims to examine the empirical effects Universal Basic Income (UBI) has to address the challenges brought forth by the substitution of human labor. Alternatively, partial versions of UBI which use only select characteristics of UBI such as unconditionality, in-cash and individuality in UBI policy implementations or UBI experiments can also be studied. Examples of policies portraying only a select characteristic of UBI that can be studied are direct cash transfer programs such as fiscal stimulus policies.

This research examines the likely effects on the technological unemployed with consideration for challenges and difficulties associated with technological unemployment. This research focused on examining the effect of UBI policies on unemployed workers and the effects of UBI on gaining new employment. Example being the challenge of crossing a skill gap by education for gaining new employment. Likewise, UBI effects for the challenges associated with technological unemployment such as the statistical higher chance of ending up in ill psychological or physical health are also relevant for this research.

3.3 Research questions

Based on the strategy and aim of this research, the following research and sub-research questions are used in this research.

Main research question: *"To what extent can Universal Basic Income address the challenges brought on by the substitution of human labor in the fourth industrial revolution?"*

First sub-research question: "*What are Universal Basic Income policies?''.*

Defining what UBI policies constitute offers clarity about the research subject of UBI policies and is crucial for the reliability of this comparative case research. For this, the source selection for the definition is important. As such, academic literature and literature of institutional reports are used to define UBI for the first sub-research question.

Second sub-research question: *''What are the challenges associated with the substitution of human labor during the fourth industrial revolution?''.*

Defining the challenges brought on by the substitution of human labor is important for making an analytical framework for analyzing the comparative case study into the policy effects of UBI. Defining the challenges gives clarity and improves reliability. Using qualitative literature sources of academic literature improves the validity of this research.

Third sub-research question: "*What effect does Universal Basic Income have on challenges brought on by the substitution of human labor that are faced by the technologically unemployed?''.*

The third sub-research question aims to answer how the policy of Universal Basic Income affects unemployed recipients of UBI policies. The third sub-research question aims to look into the effects that can address challenges associated with technological unemployment defined in the second sub-research question.

3.4 Case selection comparative case study

The strategy of the research for the third sub-research question is a comparative case study design that compares cases of Universal Basic Income experiments and policy applications of Universal Basic Income. Furthermore, policies and experiments that meet some characteristics of Universal Basic Income (e.g. unconditionality, in-cash or individuality) but deviate on other characteristics are also studied. The case identification process was based on institutional reports and articles about UBI policy applications and experiments, and universal direct cash policies akin to UBI. The world bank report from Gentilini et al. (2021) contains a recent list of all UBI pilots done. Based on data availability and accessibility, the diverse development level and geographical location, larger sample size, and the plurality of unique sources, the following cases have been used as represented in table 3, and all the cases are worked out in Appendix 1. Table 4 shows which cases from Gentilini et al. (2021) have not been included and the reason for exclusion.

Not covered in the data of Gentilini et al. (2021) is the CARES act. The CARES act offers a direct fiscal stimulus as a reaction to the COVID-19 pandemic during the largest unemployment crisis in the US since the Great Depression (Trading Economics, n.d.f). Studying the case of the CARES act allows insight into the impact of quasi-universal direct cash payments during an unemployment crisis

which can give insight into the immediate impact of direct cash policies like UBI. To get a more reliable impression of a direct cash crisis situation the Australian direct cash stimulus during the 2008 financial crisis mentioned in Gentilini et al. (2021) is also included in the cases of this study. Adding the CARES act and Australian cases to the cases of the case study can validate the research about the empirical application and effect of UBI policies as an ad hoc direct cash response policy. The initial impact of ad hoc policies could be less relevant for fully rational policy makers that anticipate situations in advance. However, knowledge for incremental policy decisions for ad hoc needs also exists (Knill & Tosun, 2012).

The approach to case selections is made on the basis of several criteria. First off, the case study wants to include studies with sample sizes where generalizations can be made based on the quantitative data of cases. One clear element that improves generalization and validity is the sample size in the cases where UBI is distributed. According to Veaux, Velleman, and Bock (2016) sample size is one of the main factors affecting power in power analysis. Power analysis can be used to ensure a higher probability to make a more valid statistical argument from quantitative data (Veaux et al., 2016). The size of a research sample or distribution size of a policy is a data point that was available in the data of Gentilini et al. (2021). Case selection is done in a way that prioritizes sample size but also diversity. Diversity in case selection is to negate cultural effects on the effects on UBI as to make results generalizable to the widest possible population. Additionally, academic literature by Mnif et al. (2018) tells of the differences in the effect of technological shock on employment in different economic development levels. To assess if the effects of UBI are applicable and similar in different states of economic development requires representative case studies on different levels of economic development. Lastly, the generosity level of UBI payments of the Italian case is considerably higher percentage wise to the medium income than other cases as shown in table 3. Including a case with a higher generosity level can show differing results of generosity levels of UBI policies.

Qualitative case study research has no standardized method of determining sample size for case studies. Although Mason (2010) says that typically the usage of cases in quantitative research varies. Dworkin (2012) tells that the recommended amount of cases for qualitative studies is between 25 to 30 studied cases. However, the most important concept in qualitative research is saturation. Saturation is when no more relevant data could be found (Dworkin, 2012). As seen in paragraph 3.7, data can differ in the form it is available. Saturation would be reached when cases show similar effects between available cases of similar situation (like control selection cases of table 2) or available similar cases are exhausted.

3.5 Reliability and validity

Control groups are contained within many cases of the comparative case study due to the comparison being partially between experiments. Using control groups exposed to similar circumstances as the experimental groups simulates randomness and makes the data from the cases with control groups more reliable. The studies with internal control groups are shown in table 1. Out of the 17 case studies, seven cases have control groups. Furthermore, one case used data comparing between sections of cohort data. The cohort data can function as a control group since only a certain group within each cohort was exposed to a UBI policy. The cohort data is from the Smoky Mountain cohort study and captures the starting period of distribution of the universal casino dividend of the Eastern Band of the Cherokee. Reliability is increased by employing triangulation by using qualitative and quantitative data (when available) for the selected cases.

Table 1: Selected cases with built-in control groups
• In the United States, a negative income experiments spread over several States from 1968 to 1980. • In the Canadian negative income experiment Mincome in Manitoba from 1975 to 1978. • In the United States at the Eastern Band of the Cherokee Nation the distribution of the casino dividend policy (1996-present). • In Kenya the NGO GiveDirectly did a Universal Basic Income experiment between 2011 and 2013 in one of the poorest regions of the country. • In Finland an experiment was conducted with unemployed people receiving basic income by the Social insurance institution (''Kela'') to measure the effect on employment gained from 2017 to 2018. • In the Netherlands the experiment ''Weten wat werkt'' tested different income support variations including UBI–esque experiments in six different cities from 2018 to 2019. • In the Korean Gyeonggi province a youth basic income was distributed to 24-year-old residents in a local currency (from 2019 till 2022).

Cases without a built-in control group require a control selection to increase reliability and validity. Policy implementation cases without control groups offer more validity due to the large scale application that a smaller experiment cannot simulate. The downside is that these policy implementations offer less reliability without a control group. Based on methodology from BMJ (n.d) a case control selection comparing similar cases is used in addition to more wide scale comparisons of the comparative case study. The case control selection does not replace the comparative case study but adds more reliability and validity. This control section uses cases with similar situations prior to the event of the UBI policy (BMJ, n.d.). This control selection can improve reliability by accounting for external events through comparison with a different case. Table 2 shows both the comparison and control case for the control section for cases without built-in control group data.

3.6 Data collection, processing, and analysis

The data collection method for all sub-research questions is by means of desk research. Data collection for the first and second sub-research question started with studying academic literature and used the snowballing method of data collection to find new sources. Research for the comparative case study of the third sub-research question similarly started with research of academic case-specific literature of the UBI case and used the snowballing method of data collection to find further sources. Literature used for answering the sub-research questions is academic and non-academic literature. Non-academic literature is primarily from institutional reports or alternatively preferably from nonpartisan sources. Depending on the data availability for a specific UBI case the collected data can both be (descriptive) quantitative and/or qualitative data. Quantitative data is preferably used to assess the effects of the policies and experiments in the UBI case studies. Furthermore, qualitative data is used to give a more valid representation of the impact UBI policies have in cases. Alternatively, qualitative data is used as a substitution when quantitative data is unavailable.

Data processing happens by organizing the gathered information in an overview of each case for the case study. The overview of all cases is added in appendix 1. Appendix 1 gives an overview of each UBI case studied. Each case first lays out the preexisting condition and in sighting causes for the UBI policy adoption and will cover the available literature focusing on the effects of the UBI. Each case in Appendix 1 gives a summary of the case at the end of the case. Data processing in cases is centered around the available data on the effects of UBI policies considering the challenges

described in the second sub-research question. Additionally, the effectiveness of the UBI policy concerning the above mentioned effects is assessed when possible within the available data. Furthermore, each case also focusses on the instigation causes for policy adoption and the underlying situation of policy adoption. This focus gives more insight into the UBI case and allows the case to be assessed through conceptual result and goal achievement. Additionally, this focus on the preexisting situation helps with evaluation of the control case selection and increases the reliability and validity of the effects observed in the case.

Data analysis is a comparative analysis of elements collected in the case study of UBI cases in appendix 1 for sub-research question three. The comparison made is between the effects of substitution of human labor in sub-research question two and the corresponding effects of the UBI cases in appendix 1.

3.7 Conceptualization and operationalization

The differences between the cases of the case studies (in e.g. location, development level, culture, and time period) can be considerable. The broad approach allows for increased validity to the main research question this research aims to answer. The differences in data availability of cases can differ. Moreover, how data is conceptualized and operationalized can differ between cases. To be considerate of external factors the case studies contain additional information surrounding the prior situation and cause of policy adoption or the motivation for the experiment.

To limit the differences in the interpretation of cases this comparative case study prioritizes effects based on quantitative data and statistical significance. The standard of statistical significant effects is held at a confidence level of 95% with an alpha level of 5% to assess the effects measured in quantitative data. Exception being that all the Dutch studies for the ‘‘Weten wat werkt’’ project use descriptive statistics that were coordinated to use a confidence interval of 90%. Whilst conceptualization and operationalization of data are affected, the conceptualization of results can be done on a statistical basis mostly found in primary sources. Additionally, secondary sources can give a contemporary or cultural interpretation of the result or effect of a UBI policy.

Differences in data operationalization may not allow for analysis of effects via statistical significance in every UBI case. Determining the validity of effects not measured via statistical significance in data such as descriptive qualitative effects is determined by if the qualitative effect appears in other cases of the case study. Particularly if the effect occurs in the control selection for the UBI case seen in table 2.

Being aware that different cultural interpretations and new insights are gained over time. A tradeoff in conceptualization and operationalization may be inherent in a (broad) comparative case study. Compared to an ex-ante standard in operationalization using conceptualization and operationalization of primary data can allow for a more valid measurement of an effect in that specific case. The primary data approach can in theory lessen the reliability of the comparison. However, data availability can necessitate primary descriptive data. For validity, the awareness of the political leaning of a source (for e.g. pillarized media or interest groups) is taken into account when evaluating a source its information. Additionally, standardized statistical data can be used when the standardized data is applicable to a scale and time period at which the UBI case study takes place. Example being national data about wealth inequality measured via standardized Gini Coefficient during the rollout of a nation-wide UBI policy.

Table 2: Use of control selection per case study	
Case	**Control method**
Australia – Great Recession (2008)	Comparison case with the United States COVID-19 pandemic, and crisis data from other OECD countries.
United States – COVID-19 pandemic (2020)	Comparison case with Australia due to similarities in crisis direct cash policy and development level.
United States – Permanent dividend fund (1982-present)	Synthetic control approach with weighted data of similar states for external effect and policy longitude data for correlations.
Iran – Fuel subsidies (2011-2016)	Comparison case with Mongolia and Italy due to similar situations of large population covering monthly payments for a nation-wide UBI program.
Mongolia – Human Development Fund (2010-2012)	Comparison case with Iran and Italy due to similar situations of large population covering monthly payments for a nation-wide UBI program. Additionally, using the same method (from Gankhuyag and Banzragch (2014) and Budragchaa et al. (2007)) as prior poverty research used to evaluate the poverty elevation impact of direct transfer to Mongolian children.
Kuwait – Amiri grant (2011)	Comparison case with Hongkong and Macau due to similar situations. All these areas consist of a similarly urbanized area that is densely populated.
Italy - Citizens income (2019)	Comparison case with Iran and Mongolia due to similar situations in large scale nation-wide UBI policy.
China – Macau (2008-present)	Comparison case with Hongkong and Kuwait due to similar situations. All these areas consist of a similarly urbanized area that is densely populated. Additionally, using previous academic research done in Macau about the willingness to pay (WPS) for social programs as control data to compare to the WPS of UBI.
China – Hongkong (2011, 2018, 2020 & 2021)	Comparison case with Macau and Kuwait due to similar situations. All these areas consist of a similarly urbanized area that is densely populated.
Namibia (2007-2009)	Comparison case with Kenya GiveDirectly experiment due to similar development status and the experiments were done in a relatively similar time period.

Table 3: UBI Cases studied

Initiative (Year)	Uncon-ditional	Cash-based	Uni-versal	State-provided	Scope	Frequency/Size	Median household income per year (%)	Median income per capita per year (%)	Population coverage
Australia – Great Recession (2008)	No	Yes	Nearly	Yes	National	One-time payment of around 900 UAD (around 630 USD in 2008 or around 900 USD in 2013)	46,565 USD (1.3% in 2008 or 1.9% in 2013)	15,026 USD (4.2% in 2008 or 6% in 2013)	8,7 million Australians
United States – CARES ACT (2021)	No	Yes	Nearly	Yes	National	One-time payment of 1,200 USD to every person earning less than 75,000 or households earning less than 150,000	43,585 USD (2.7%)	15,480 USD (7.8%)	88% of adults
Mongolia (2010-12)	Yes	Yes	Yes	Yes	National	Tog 10,000 (7 USD) per month 2010; Tog 21,000 (17 USD) per month until 2012	5,922 USD (2012; 3.44%)	1,440 USD (2012; 14.16%)	3 Million (100% population)
Iran (2011-2016)	Yes	Yes	Yes	Yes	National	Rls 445,000 (40 USD –45 USD) per person per month (25% of median income)	12,046 USD (3.98% - 4.48%)	3,115 USD (15.4% - 17.34%)	Around 72,5 million Iranians (97% of population)
United States - Alaska (1968-present)	Yes	Yes	Yes	Yes	State	1,000 USD – 2,000 year USD	USD43,585 (2.29% - 4.59%)	USD15,480 (6.46% - 12.92%)	615,000
United States - Eastern Band of the Cherokee Nation – (1996-present)	Yes	Yes	Yes	Yes	Tribe	4,000 USD – 6,000 USD year (disbursements made every 6 months)	USD43,585 (9.18% - 13.77%)	USD15,480 (25.84% - 38.76%)	16,000

Kuwait - Amiri grant (201)	Yes	Yes	Yes	Yes	National	One-time 3,600 USD	USD 40,854 (8.81%)	USD 7,847 (45,88%)	1,1 Million
Italy - Reddito di Cittadinanza (2019)	No	Yes	No	Yes	National	€780 month (858 USD)	20,085 USD (51.26%)	6,874 USD (149.78%)	5 million
China - Macau SAR (2008-present)	Yes	Yes	No	Yes	Region (resident and non-resident holders of Macau resident identity cards)	Variable annual payments; in 2019, P 10,000 (1,250 USD)for residents P 6,000 (750 USD) for nonresidents	No data	No data	707,000
Kenya - GiveDirectly (2011-2013)	Yes	Yes	Yes	No	Households (alternating randomly between male and female heads of household)	Long-term UBI: monthly payments equivalent to 23 USD (0.75 USD per day) for 12 years Short-term UBI: monthly payments equivalent to 23 USD (0.75 USD per day) for two years Lump-sum UBI: 500 USD one-off	USD 1,870 (14.76%)	402 USD (68.66%)	21,000
United States 1970s (Indiana, Iowa, New Jersey, North Carolina, Seattle/ Denver)	Yes	Yes	No	Yes	Households	Variable guarantee levels and marginal tax rates	No data	No data	9,924 (initial target)

Canada (Manitoba/ Mincome) 1970s	Yes	Yes	No	Yes	Households	Variable guarantee levels and marginal tax rates: Can$3,800, 0.35 Can$4,800, 0.50 Can$5,800, 0.75	No data	No data	1,300
Namibia - Otjivero Omitara (2007-2009)	Yes	Yes	Yes	No	Individuals	100 USD per month	No data	No data	930
Finland – Kela (2017-2018)	Yes	Yes	No	No	Unemployed	€560 (616 USD) /month	24,615 USD (30%)	15,725 USD (47%)	2,000
Republic of Korea – Gyeonggi (2019-2022)	Yes	No	No	Yes	24-year-olds	883 USD per year	40,861 USD (2.16%)	11,950 USD (7.39%)	170,000

Based on data from a World Bank report from Gentilini et al. (2021) and data from Gallup its country data set from Phelps and Crabtree (2013)

** Columns seven and eight based on data set from country data set from Phelps and Crabtree (2013)*

Table 4: Excluded cases and exclusion reason

Cases	Exclusion reason
Maricá, Brazil – Renda Básica de Cidadania	Little quantitative data is available in English. Direct cash as crisis and pandemic response does overlap with CARES Act which has more available data.
Ontario, Canada (Thunder Bay, Lindsay, and Hamilton) funded by the government of Ontario	Overlap with other cases, comparable development of Korea and Finish and Dutch while smaller sample size or sample not being targeted at unemployed recipients.
Madhya Pradesh, India – Madhya Pradesh Unconditional Cash Transfers Project: UNICEF/SEWA	The setup and conditions would be similar to other case studies. Additionally, the case has fewer unique sources of available data than similar cases studied.
Barcelona, Spain – B-Mincome: City Council of Barcelona	Spain has similar economic circumstances to Italy, while Italy offers a wider scale of implementation and can thus hopefully show more policy roadblocks.
Busibi Village, Uganda: Eight	Overlapping in conditions with Namibian and Kenyan cases, while having a smaller sample size of 150 participants.
Stockton, California, United States: Stockton Economic Empowerment Demonstration (SEED) (Government of Stockton)	Small sample size of 125 residents.

4.0 Results

Chapter four presents the results for the different sub-research questions. The first paragraph presents an answer to the first sub-research question to define what UBI policies are. The second paragraph answers the second sub-research question posed by this research by giving the challenges brought forth by the substitution of human labor. The third sub-research question compares the effects seen in studied UBI cases to the challenges of the substitution of human labor.

4.1 What is UBI

This research asks as first sub-research question: *"What are Universal Basic Income policies?''*. This paragraph answers the first sub research question based on academic and institutional literature.

Universal Basic income is commonly categorized with several uncontentious characteristics. Bidadanure (2019) describes three characteristics of UBI as in-cash transfers, individual transfers, and unconditional transfers. Ghatak and Maniquet (2019) define a UBI policy as *''… a universal and unconditional stream of cash income paid by the government to every member of society''* (p. 896). Gentilini et al. (2021) describe the three categories of UBI as: unconditionality without means tested eligibility, transferability of in-cash payments and universality as opposed to a categorically targeted policy.

Ambiguity and contention surround some characteristics of UBI policies. The commonly cited academic definition Van Parijs (2004) uses for UBI is: *''A basic income is an income paid by a political community to all its members on an individual basis, without means test or work requirement.''* (p. 2). Van Parijs (2004) elaborates that a UBI *''paid by a political community''* (p. 2) does not need to be a nation state. Additionally, while basic income is paid from politically controlled resources it does not need to be funded with redistributive taxation (Van Parijs, 2004). However, the redistributive use of UBI policies are discussed in academic literature by Fouksman and Klein (2019). Fouksman and Klein (2019) argue a redistributive UBI policy is needed to decrease wealth inequality. Furthermore, UBI policies differ on the membership of the political community. The UBI definition of Van Parijs (2004) contains the phrase *''to all its members''* (p. 2). Van Parijs (2004) elaborates that eligibility for a UBI policy may be defined by denying eligibility to several groups of people like residents, children or prisoners. Bidadanure (2012) agrees that eligibility for children is not a given in UBI policies. Bidadanure (2012) notes that in most UBI policies children are eligible for half the amount the UBI policy pays out to adults. Bidadanure (2019) describes other forms of eligibility for children like baby bonds. Baby bonds are invested at birth and only accessible once the individual has reached adulthood (Bidadanure, 2019).

Summarizing, the first sub-research question asked *"What are Universal Basic Income policies?''*. Academic literature described several characteristics to Universal Basic Income. Universal Basic Income has uncontentious characteristics of unconditional and in-cash transfers which are paid on an individual basis. Ambiguity and contention exist over the distributive or redistributive nature of UBI policies. Moreover, differences in approaches exist of who belongs in a political community for receiving a Universal Basic Income. With differences in universal eligibility possibly excluding children, immigrants or prisoners. A UBI policy can offer different variations (like halved payment) of UBI to the members with above-mentioned unclear membership of the political community.

4.2 Challenges associated with technological unemployment

This research asks as second sub-research question : *"What are the challenges associated with the substitution of human labor during the fourth industrial revolution?''*. Based on the academic literature several different challenges can be formulated associated with unemployment during Industry 4.0.

Workers getting replaced by technology means the worker loses its means of making a living. Both Ferraresi et al. (2019) and Furkanetto et al. (2019) argue that technological change affecting employment will impact extensive margins comparatively more than unemployment during business cycles. What this means for unemployment is that demand for specific forms of employment will disappear rather than that demand for specific employment will decrease overall and reduce working hours (Ferraresi et al., 2019; Furkanetto et al., 2019). Meaning that unemployment during Industry 4.0 will affect individuals more heavily but overall unemployment will be lower than during business cycle busts. This implies the financial burden of unemployment may be heavily carried by a smaller number of individuals than during business cycle unemployment.

The technological advancements of Industry 4.0 hold unique challenges depending on the characteristics of different occupations. Academic literature differentiates the challenges of technological change for employment based on skill levels of employment. Mnif et al. (2018) argue that technological change affects employment of different skill levels differently. Mnif et al. (2018) argue that low-skill labor encounters a replacement effect and that new forms of increasingly physical low-skill labor will appear.

Middle and high-skill employees face different challenges due to technological innovation. Autor et al. (2015) argue that AI will largely replace middle-skill supporting occupations. An example of what the replacement means for middle and high-skill employees is given by Picciano (2019). Picciano (2019) argues that advancements in AI technology would assist teachers in their occupation but that middle-skill employees fulfilling supporting staff roles will be most affected by technological unemployment. Mnif et al. (2018) argue that middle-skill and high-skill employment will not be permanently replaced but will be compensated over time with new similar employment opportunities. However, for this compensation effect to take place the employees must bridge two gaps. Mnif et al. (2018) describe two gaps, a geographical gap and for higher-skilled employees the knowledge gap. The knowledge gap can be bridged by gaining new skills through education (Mnif et al., 2018). However, education is not only helpful for middle to high-skilled employees gaining new employment. Pfeiffer and Suphan (2015) argue that education can help all skill levels of employment raise their laboring capacity. Although laboring capacity predominately correlates with skill in employment level. Low-skill technical workers can gain a higher laboring capacity than university graduates (Pfeiffer & Suphan, 2015). However, relying on education to train skills is a lengthy process with no immediate payoff. Furthermore, the geographical gap Mnif et al. (2018) describe means that new employment opportunities may not come within the same geographical area. Solving the geographical gap requires moving or emigrating to a new geographical area (Mnif et al., 2018).

The challenges of technological unemployment are not exclusively defined to financial struggles and struggles in gaining new employment. Schöb (2012) argues that an initial problem unemployed workers face is the loss of an identity due to the unemployed worker their identity being tied to the terminated employment. Moreover, unemployment brings increased risks of ill psychological and physical health. Bartley (1994) argues unemployed are up to 313% more likely to be in bad health. The four main causes of ill health and higher mortality are relative poverty, social isolation, loss of self-esteem, and health-related behavior like increased smoking and drinking (Bartley, 1994). Additionally, Cooper et al. (2006) argue unemployment is associated with higher rates of mortality. Taylor et al. (2005) tell that earlier mortality is also increased by suicide that

correlates primarily with employment status and comorbid with above mentioned problems of unemployment. Taylor et al. (2005) argue that anxiety increases the suicide risk for females, and depression and substance abuse increase the suicide risk for males. Contrary to this, Pompili et al. (2010) argue that in a multivariate analysis only unemployment correlates significantly with suicide. As such the relevance of mental health on suicide during unemployment may be scant. Mental health problems during unemployment are linked to several factors. Meltzer et al. (2010) argue that psychological health problems during unemployment are due to job insecurity. Additionally, McKee-Ryan et al. (2005) argue that longer unemployment correlates with risk of mental health issues. Angermeyer et al. (2013) argue mental health problems and income loss can create a vicious cycle that makes gaining new employment more difficult.

Summarizing, this paragraph presents the results to the second sub-research question of: ''*What are the challenges associated with the substitution of human labor during the fourth industrial revolution?*''. The challenges covered in academic literature are financial struggles of unemployment, struggles in gaining new employment, increased mortality by increased suicide risk, and ill mental and physical health. The predicted demand disappearance for specific positions will create narrow but intense financial struggles under the working-age-population. The struggle of gaining new employment is magnified for employees of middle and higher skill levels because of the needs of gaining new skills. Gaining new skills requires education. Unemployed workers have an increased risk of ill mental health, ill physical health, and higher rates of suicide. Psychological and physical health problems can create a vicious cycle that makes gaining new employment more difficult. Higher rates of suicide affect unemployed males more than females.

4.3 In what way can UBI help with the challenges of technologically unemployment?

The third sub-research question asks: "*What effect does Universal Basic Income have on challenges brought on by the substitution of human labor that are faced by the technologically unemployed?''.* Sub-research question three is answered based on applicable data about the challenges from the comparative case study on UBI policies and experiments. The studied cases of UBI policies and experiments are comprehensively described in Appendix 1.

The challenges faced by the technological unemployed are discussed in the previous paragraph. Challenges discussed in paragraph 4.2 form sub-paragraphs of paragraph 4.3. The loss of employment comes with financial struggles for the former employee on an individual or household level. The effects of UBI on household financial resilience will be covered in sub-paragraph 4.3.1. Gaining new employment allows the employee to financially sustain their lifestyle. However, technical unemployment for middle and high-skill occupations requires bridging a skill gap by gaining education. The effects of UBI on obtaining new employment or increased educational attainment will be covered in sub-paragraph 4.3.2. Unemployed workers face the challenges of ill mental and physical health and higher rates of mortality. The effects of UBI on psychological and physical health are covered in sub-paragraph 4.3.3. Each sub-paragraph has a summary at the end of the paragraph. Furthermore, a conclusive summarized answer to sub-research question three is given in paragraph 4.3.4.

4.3.1 Effectiveness for increasing household resilience

This paragraph compares the data of UBI cases about financial resilience to the challenges of financial struggles during unemployment.

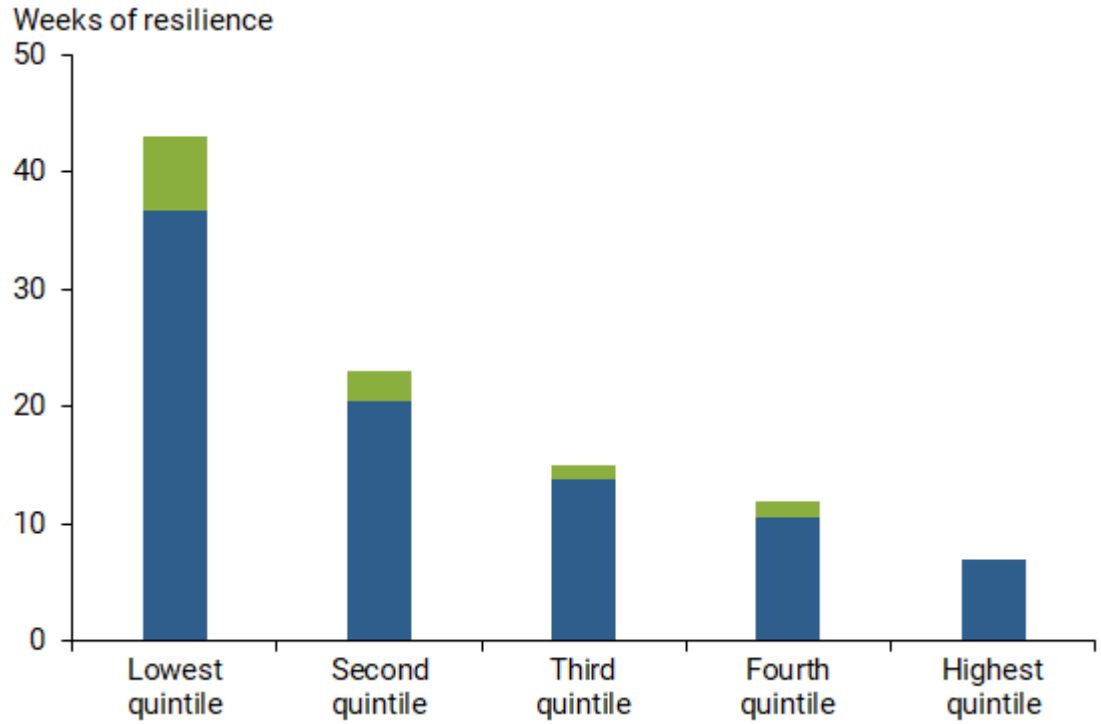
The financial struggle associated with unemployment can cause problems for a household its financial resilience. Poverty is an extreme form of financial struggles. Several UBI Cases have shown effects of reducing poverty. Enami and Lustig (2018) argue that the Iranian UBI policy reduced the poverty headcount ratio from 22.5% to 10.6% during the initial stages of the program. Similarly, Yeung and Howes (2015) argue that the Mongolian Human development Fund (HDF) policy reduced poverty over the three year lifespan of the program. The estimation of poverty reduction of the HDF varies between 10% and one-third (Yeung and Howes, 2015).

UBI recipients report increased financial well-being compared to recipients of means-tested unemployment benefits. Kangas et al. (2019) argue that Finnish recipients of UBI reported more often that they were financially comfortable or stable and reported less often that they had financial struggles compared to recipients of unemployment benefit. For instance, 11.9% of the UBI recipients reported that they were financially comfortable compared to 7.4% of the unemployment benefit recipients. Likewise, 48.1% of the UBI recipients reported no financial struggles compared to 43.5% of the unemployment benefit recipients (Kangas et al., 2019). Similar effects can be seen in the Korean youth Basic Income (YBI) case. Recipients of YBI reported a statistically significant higher score for having a positive financial future perspective after receiving YBI (Yoo et al., 2020). During the Finnish UBI experiment unemployment benefits were retroactively paid out after eligibility requirements like job searching quotas were met. In contrast, UBI guaranteed a stable income without additional requirements (Kangas et al., 2019). The guaranteed payout of UBI policies could contribute to the feeling of increased financial well-being that UBI recipients experience.

However, a Universal Basic Income transfers cash unconditionally to all members of a certain political community. The loss of employment during technological shocks will weigh heavier on full-time position (extensive margin) than on general hours of employment lost (intensive margin) according to Ferraresi et al. (2019) and Furkanetto et al. (2019). UBI can be effective in helping financially struggling households make ends meet. However, UBI policies lack behind in budgetary efficiency compared to conditional unemployment insurance welfare policies.

Household resilience allows households to withstand and rebound from disruptive financial challenges like unemployment. Perhaps the effect of UBI on household resilience is best exemplified by the large economic downturn and subsequent huge unemployment during the COVID-19 pandemic in the US. The response of the US government to the financial problems of the COVID-19 pandemic was the CARES act. The CARES Act introduced two policies to alleviate the financial struggles of the COVID-19 pandemic. First, the CARES act introduced a paycheck protection unemployment insurance policy that cost a total of 250 billion USD. The paycheck protection unemployment insurance policy would pay 600 USD per week to an unemployed individual. Second, the CARES act introduced a one-time direct transfer fiscal stimulus (similar to a UBI policy) of a maximum of 1,200 USD per person with a total cost of 301 billion USD. The paycheck protection unemployment insurance program contributed in a greater manner to household resilience than direct cash transfers whilst having a smaller budget. Aylward et al. (2021) argue the paycheck protection unemployment insurance contributed significantly to the resilience of the lowest income households. Aylward et al. (2021) note 85% of the resilience of a median lowest income quintile household was based on unemployment insurance. Contrary to the unemployment insurance policy the direct cash transfers had an insignificant effect on household resilience (Aylward et al., 2021). The effects of the paycheck protection unemployment insurance and direct cash transfers on household resilience can be seen in figure 3.

Figure 3: Effect of stimulus compared with unemployment insurance for household resilience



Blue part of the bars represents the effect of unemployment insurance on financial resilience while the green part of the bars represents the effect of fiscal stimulus on financial resilience.

Retrieved from Aylward et al. (2021)

Additionally, Aylward et al. (2021) argue the household resilience may be positively skewed by the cut-off point of eligibility of the fiscal stimulus. As the average resilience the fiscal stimulus created would have been lower if the CARES act did not have a cut-off point for eligibility of an annual income of 75,000 USD for individuals and 150,000 USD for households (Aylward et al., 2021).

In summary, technological unemployment will see more full job positions disappear rather than a cutting of working hours. UBI cases show a UBI policy can decrease poverty and a UBI policy increases the feeling of financial well-being. However, a side to side comparison between unemployment benefits and a universal direct cash transfer policy shows that UBI contributes significantly less to household resilience than a targeted means-tested unemployment policy.

4.3.2 Efficacy in gaining employment

When employees become unemployed, the typical reaction is to attempt to gain new employment to provide for their cost of living. Unconditionality of a UBI policy would allow the unemployed fewer bureaucratic interferences when attempting to find a new means of gaining income (Kangas et al., 2019). Additionally, UBI provides a fallback option to explore employment opportunities. The fallback option allows the unemployed greater bargaining power which can provide a better opportunity for job security in the future (Verlaat et al., 2020).

However, no evidence exists that unconditional cash transfers increase employment gained

by UBI recipients. Kangas et al. (2019) note that in a Universal Basic Income experiment done with Finnish unemployed UBI recipients showed no significant increase in employment gained compared to the control group. The 1% increase in entrepreneurship under the UBI recipients had no statistical significance (Kangas et al., 2019). Similarly, the ‘‘Weten wat werkt’’ experiment done in the Netherlands showed no overall statistical significant increases in employment gained by unemployed UBI recipients (Sanders et al., 2020).

While both the Finnish and Dutch experiments conducted specifically with unemployed UBI recipients receiving a comparable monetary amount to unemployment insurance showed no statistically significant increase in UBI recipients finding employment. Neither was a statistically significant decrease observed under unemployed UBI recipients in gaining employment. Thus, UBI has a comparable efficacy to welfare programs for gaining employment. Furthermore, De Boer et al. (2020) note that during the Dutch experiment employment gained differed greatly based on region. Thus, local economic booms might impact employment gained by unemployed more than either a UBI policy or an unemployment insurance policy.

The type of employment gained matters due to different challenges associated with technological unemployment between different skill levels of employees. Low-skill unemployed find new employment relatively fast compared to middle and high-skill unemployed during technological unemployment (Mnif et al., 2018).

Considering the Dutch ‘‘Weten wat werkt’’ experiment Verlaat et al. (2020) argue the city of Utrecht showed a statistically significant difference in the skill level of employment gained. Lower educated unemployed were able to gain employment more often at a statistically significant rate compared to higher educated unemployed (Verlaat et al., 2020). The type of employment gained matches characteristics of the replacement effect (Mnif et al., 2018) The lower skilled employment gained during UBI offers no distinct difference compared to the challenges faced during Industry 4.0. In the replacement effect low-skill unemployed find new employment relatively fast compared to high-skill unemployed (Mnif et al., 2018). As such, employment gained by unemployed UBI recipients likely does not contribute to decreasing long term cases of technological unemployment.

Experiments dealing with unemployment do not differentiate between technical unemployment and business cycle unemployment. The difference between technical unemployment and business cycle unemployment is that technical employment of a certain skill permanently disappears leaving a skill gap while in business cycle unemployment demand for the skills of the unemployed eventually returns (Mnif et al., 2018; Tsaliki and Vardalachkis, 2011). As such, middle and high-skill employees require retraining to gain new similarly skilled employment during technical unemployment (Mnif et al., 2018). Furthermore, education on any skill level may aid in increasing the labor capacity of a worker and prevent future unemployment (Pfeiffer and Suphan, 2015).

UBI does not show an increase in the likelihood of an adult recipient pursuing or obtaining an education. The Youth Basic Income distributed in the Korean Gyeonggi province has shown no statistically significant increase in youth (24-year-olds) pursuing job training (Yoo et al., 2020). UBI experiments do show an increase in educational gain. However, the increases in educational gain centers mainly around high school completion and dropout prevention. Nonetheless, Pfeiffer and Suphan (2015) argue the effect of education on increasing labor capacity and gaining employment is also increased by other forms of training and education rather than high and middle-skill education alone. A low-educated technician may have better employment opportunities than a university graduate (Pfeiffer & Suphan, 2015). UBI programs have shown some degree of improving educational gain. Akee et al. (2010) argue the Casino dividend for the Eastern Band of the Cherokee Nation improved educational gain. Every additional 4,000 USD annually increased educational attainment by one year for 21-year-olds and children increased school attendance. The increase in educational gain by the Casino Dividend was driven by the effects on poorer households (Akee et al., 2010).

Furthermore, Haushofer and Shapiro (2016) argue UBI payments during the GiveDirectly UBI experiment in Kenya helped increase educational attainment as households spending on education increased by 23%. Follow-up interviews of the GiveDirectly experiments show that payments went towards paying school fees which resulted in increased school attendance for children and children completed more years of education (Haushofer & Shapiro, 2016; Matthews, 2017a). Similar results to the Kenyan experiment are seen in the Basic Income Grant (BIG) experiment in Namibia. Where BIG payments increased school attendance and reduced the dropout rate of enrolled students from 60% to almost 0% after one year of UBI payments (Haarman et al, 2009). Furthermore, earlier NIT-experiments also found evidence that guaranteed income transfers increased household spending on the education of children (Hanushek, 1986).

In summary, UBI policies have shown no statistically significant improvements in gaining employment over other unemployment benefits. Whether this is due to similar efficiency of policies or the efficacy of unemployment programs is unclear. All unemployment policies including UBI show significantly higher rates of employment gain for low-skill workers. Low-skill unemployed workers are similarly predicted to find new employment sooner compared to middle and high-skill unemployed employees during technological unemployment. Educational attainment increases laboring capacity and helps in closing the skill gap of technological unemployment. UBI has shown to increase educational attainment for adolescents and children. Every 4000 USD of UBI distributed was found to correlate with an extra year of educational attainment in a United States based UBI case. In cases in African nations UBI assisted households in affording school fees and thus increased school attendance and years of education obtained. However, UBI has shown no increases in educational attainment by workforce age adults.

4.3.3 Effects of unemployment on health

Academic literature tells that the loss of work is associated with the higher likelihood of decreased physical and psychological health. An unemployed person is between 22% and 313% more likely to be in worse physical health compared to an employed person (Cooper et al., 2006). Unemployment is associated with ill health and a higher rate of mortality (Bartley, 1994). Unemployed workers lose their identity that was gained from terminated employment (Schöb, 2012). Bartley (1994) argues the main causes of higher mortality during unemployment are suicide, relative poverty, loss of self-esteem, social isolation, and health-related behavior like increased alcohol consumption or smoking.

Several cases show evidence of UBI reducing negative health-related behavior. The GiveDirectly UBI experiment in Kenya saw a reduction in consumption of negative health related products for the test group, with alcohol consumption reducing to 44% and tobacco consumption was reduced to 40% compared to the control group its consumption (Haushofer & Shapiro, 2016). Furthermore, Costello et al. (2010) tell that payments from the casino dividend to tribe members of the Eastern branch of the Cherokee nation reduced substance abuse and substance dependence significantly. Substance abuse and dependence for alcohol and cannabis was statistically significantly reduced among tribe members receiving dividend payments (Costello et al., 2010). A later study does argue that the casino dividend payments caused a significant reduction in smoking among tribe members (Wolfe et al., 2012).

However, while UBI can reduce alcohol, tobacco and cannabis consumption, other cases of UBI policies show signs of increases in alcohol consumption surrounding the date of pay-out. This increased alcohol consumption is shown during the Namibian Basic Income Grant (BIG) experiment. Haarmann et al. (2009) tell that the local village committee made agreements with liquor sellers not to sell alcohol on the day UBI payments were received to stop alcohol abuse. However, how widespread alcohol abuse was during the BIG experiment or the exact effects of UBI on alcohol consumption or abuse during the BIG experiment are unknown (Haarmann et al., 2009). Some

unclarities remain, but the events of the BIG experiment do indicate some form of increased alcohol abuse. The effect of UBI on increasing alcohol abuse has also been observed in Alaska with Permanent Dividend Fund (PDF) payments between the years 2000 and 2016. Watson, Guettabi and Reimer (2019b) argue the UBI payments in Alaska correlated with a 10% increase in policing for substance abuse during the date of the UBI payout. Furthermore, the need for medical assistance required for substance abuse also increased in correlation to the size of the UBI payment (Watson et al., 2019a).

Relative poverty is one of the main causes of higher mortality associated with unemployment. Relative poverty is poverty that withholds individuals from participation in activities that are socially encouraged and approved by society (Ravallion & Chen, 2011). Relative poverty can take many forms. One such form of relative poverty is related to food insecurity. Relative food insecurity can be a lack of access to healthy nutritional foods (Booth & Smith, 2001). Evidence from Universal Basic Income cases suggests UBI increases (relative) food security. First off, Haarmann et al. (2009) note improved food security reduced malnutrition among the children of recipients. Improvement in nutrition reduced underweight in children from 42% of children prior to the experiment to 10% of the children being underweight after 12 months of UBI payments (Haarmann et al., 2009). Increasements in food security correlated with investment in livestock during the Namibian and Kenyan UBI experiment (Haarmann et al., 2009; Haushofer & Shapiro, 2016). Haushofer and Shapiro (2016) argue livestock investments increase food security during the Kenyan UBI experiment resulting in a 42% decrease in the chance that children would go a day without food.

Similarly, other UBI cases saw increased food security and food variety for UBI recipients. Heyrani (2020) argues that the change of fuel subsidies into universal grants in Iran allowed urban households greater food security. However, the policy change had no effect on the food security of rural households. The greater urban food security was due to increased spending on food (Heyrani, 2020). The greater urban food expenditure translated into healthier nutritional purchases increasing caloric, protein and vitamin intake (Mostafavi-Dehzooei, Salehi-Isfahani & Hehmatpour, 2020; Heyrani, 2020). Similar to the UBI policy in Iran the GiveDirectly UBI experiment done in Kenya also saw increases in food security. Although food security was only measured by the caloric intake and not other aspects of nutrition (Junior and Katz, 2016). Yoo et al. (2020) argue data from the Korean YBI (Youth Basic Income) policy showed a significant increase in the fruit consumption of UBI recipients after one year of receiving basic income. However, the change in fruit consumption was not significant compared to the control group (Yoo et al, 2020).

Unemployed are up to 313% more likely to end up in bad health (Cooper et al., 2006). However, studies find UBI recipients more often live healthier. Both Kangas et al. (2019) and Yoo et al. (2020) argue recipients in the Finish experiment and recipients from the Korean YBI experiment reported significant improvement in perceived health and cognitive ability. Furthermore, Yoo et al. (2020) note recipients of YBI engaged in healthy behavior significantly more often. As YBI recipients started more diets compared to before receiving YBI. Additionally, YBI recipients completed significantly more workouts as prior to receiving YBI. However, the only statistically significant trend among YBI recipients compared to the control group was healthier eating habits (Yoo et al., 2020). Additionally, Haarmann et al. (2009) argue the UBI payments made healthcare more financially accessible for more people. The local health clinic saw a fivefold increase in revenue over the runtime of the Namibian UBI experiment (Haarmann et al., 2009).

Social isolation is one of the main factors associated with unemployment that causes earlier mortality (Bartley, 1994). UBI cases have shown increased social behavior. Haarmann et al. (2009) tell the Namibian Basic Income Grant policy saw recipients becoming more active in the local community and forming a committee to coordinate UBI spending. Furthermore, Yoo et al. (2020) note the Korean YBI experiment used a preexisting local digital currency that is only usable at small to medium

local enterprises. Lee, Lee and Kim (2020) argue that recipients of YBI are more interested in fostering local communities. 80% of recipients of YBI answered in a survey that use of the local currency is convenient and satisfying (Lee et al., 2020). The increase of social activity via local committee was only shown in the Namibian UBI case. Likewise, increased social behavior seen during the Korean YBI experiment may be more representative of the local currency and less representative of an in-cash UBI policy.

Unemployed workers lose their identity that was tied to the terminated employment. Unemployed UBI recipients increase their job search activities significantly. Unemployed recipients of the CARES Act stimulus and unemployed recipients of Youth basic income significantly increased their hours spent on job searching (Coibion et al., 2020; Yoo et al., 2020). Furthermore, employed recipients of Youth Basic Income valued their work significantly more compared to the control group (Yoo et al., 2020). However, receiving a UBI has shown no effect on the identity of the unemployed worker.

Unemployment is associated with negative effects on psychological health (Cooper et al., 2006). Bartley (1994) argues one of the main causes of higher mortality related to unemployment is suicide. Adding to this, Taylor et al. (2005) argue many factors contribute to the significant risk increase of suicide. Although unemployment is the strongest predictive factor of suicide. The mental health issues of anxiety for females and depression for males increase suicide risk significantly (Taylor et al., 2005). Furthermore, rapid technological advancement also advances technology used in the private life of the unemployed (Ghislieri et al., 2017; Derks et al., 2014). Adapting to new technologies and discovering social norms for the use of new technology can cause conflicts (Turel et al., 2011; Quinones et al., 2016).

Receiving basic income reduced the stress, anxiety and depression recipients experienced. Kangas et al. (2019) argue the basic income experiment in Finland has shown a statically significant reduced frequency of stress compared to other unemployed workers in the control group. While 8.8% of unemployed people in the control group reported a high degree of stress, only 4.8% of the unemployed in the basic income group reported a high degree of stress. Similarly, Kangas et al. (2019) note 16.2% of unemployed in the control group reported some amount of stress compared to 11.8% of unemployed in the basic income group (Kangas et al., 2019). Other applications of basic income also show a reduction in mental health disorders. Costello et al. (2010) argue the casino dividend payments to tribe members of the Eastern Band of the Cherokee Nation reduced psychiatric disorders in the youngest cohort group at 31.4% compared to the 41.7% of psychiatric disorders of the middle cohort group and the 41.3% of psychiatric disorders in the older cohort group. The youngest cohort group had parents that received basic income for the longest period compared to other cohort groups. Additionally, Costello et al. (2010) note that tribe members from the youngest cohort group had significantly lower rates of psychiatric disorders at 30.2% compared to 36% of white Americans of the same cohort (Costello et al., 2010). Similarly, Wolfe et al. (2012) found that increased income from the casino dividend had reduced anxiety. Furthermore, Yoo et al. (2020) tell that the Korean YBI policy found that basic income was significant in reducing depression and worry among recipients. However, the YBI policy had no significant effect on other mental health difficulties recipients faced. Additionally, the survey after the first year of the experiment showed that recipients of YBI felt increased happiness at a statistically significant rate compared to the control group. Moreover, Yoo et al. (2020) note recipients of YBI reported a statistically significant higher life satisfaction compared to the control group. Finally, recipients of YBI reported both that they felt happier and had fewer negative emotions at a statistically significant rate compared to the control group (Yoo et al., 2020).

UBI policies show significant improvement for a non-unemployed UBI recipient its mental health. Furthermore, mental health problems affecting the unemployed disproportionately affect

men (Viinamaki et al., 1993; Pompili et al., 2014). The disproportionate effect on mental health for unemployed men is due to the unemployed failing to live up to the traditional masculine belief that men need to provide for the household its income (Moller-Leimkuhler, 2003). However, the mental health effects of UBI show no disproportionate difference among gender. Unemployed struggling with mental health issues during technologically unemployment would more often be male rather than female. As such the results of UBI on mental health suggest that UBI would have a limited effect on unemployed during technological unemployment.

Direct cash transfers like UBI have no data on one of the main mortality increasing behaviors of suicide during unemployment (Bartley, 1994). Direct UBI case have shown a significant improvement in mental health. Nonetheless, the effect of mental health issues like depression and anxiety on suicide in relation to unemployment are scant (see paragraph 4.2). Thus, the effect of UBI transfers on reducing suicide by the unemployed may likely be limited.

Summarizing, unemployed face challenges to mental and physical health. Unemployed are up to 313% more likely to be in ill health and risk higher mortality rates. Causes of the increased risk of bad health are bad health behavior, relative poverty, social isolation or mental health problems. UBI has shown to have a statistically significant effect on positive lifestyle choices like healthier food and more exercise and UBI can reduce elements of relative poverty. UBI is shown to have an effect on substance abuse with substance abuse reductions in some UBI cases and substance abuse increases in other UBI cases. Increases in substance abuse center around alcohol abuse during UBI payments. UBI has shown to have a statistically significant effect on reducing mental health problems. However, unclarity remains if UBI would be effective against the mental health problems associated with suicide and by extension if UBI would reduce suicidal behavior. Furthermore, cases show UBI can reduce social isolation. However, the cases that saw a reduction in social isolation may not have a repeatable effect or the characteristic that induced the effect may not fit the definition of UBI. On a final note, receiving a UBI payout has no effect on the identity of an unemployed worker.

4.3.4 UBI effect against technological unemployment

The third sub-research question asked: *"What effect does Universal Basic Income have on challenges brought on by the substitution of human labor that are faced by the technologically unemployed?''*. On the challenge of financial struggle following unemployment UBI shows a definitive difference compared to a conditional tested welfare scheme. The effects of UBI contribute less to household resilience for unemployed and a UBI policy would be monetarily inefficient when compared to a targeted conditional unemployment welfare scheme. Gaining new employment is the most straightforward manner of reducing financial struggles and ending unemployment. However, unemployed recipients of UBI did not significantly gain new employment at a higher rate compared to a control group. Considering middle and high-skill technological unemployed face a skills-gap that requires education for gaining new employment. The effects of UBI on educational gain concentrates on primary and high school education for children of UBI recipients. Despite the educational effects of UBI not helping working age adults, the educational effects would increase future labor capacity of children. A UBI policy would not contribute to educational gain in the working age population needed to close the skill gap for technological unemployment. Unemployment has negative physical and mental health effects. UBI has shown statistical significant effects for helping with many challenges unemployed face by e.g. improving physical and mental health, reducing stress and anxiety, reducing relative poverty, and reducing negative health behavior. However, the effects of UBI on unemployment induced suicide are unknown. Likewise, the effects of UBI on decreasing social isolation are likely not repeatable or do not fit the definition of a UBI policy.

5.0 Conclusion and Discussion

Chapter 5 will focus on converting what was learned during the research into writing. First, this research will provide an answer to the main research question in the conclusion by comparing the likely effect of UBI to the challenges of industry 4.0. Next, this research will discuss gaps in current knowledge and possibilities for future research. After that, several UBI policy variations and their advantages and disadvantages will be discussed. Next, factors limiting this research and their effect will be discussed. Finally, a broader discussion about the research that assesses the findings for what implications this research can have for other research and what this implies for other aspects like public administration.

5.1 Conclusion

This research aimed to find out *"To what extent can Universal Basic Income address the challenges brought on by the substitution of human labor in the fourth industrial revolution?"*. Based on academic literature of human substitution during the anticipated fourth industrial revolution and case analysis of Universal Basic Income (UBI) cases this research concludes that the effect of UBI would likely be inefficient for the financial struggles of unemployed and labor market challenges of industry 4.0. The challenges caused by human substitution during the fourth industrial revolution are a diverse set of challenges. The technological unemployment brought on by substitution from certain forms of employment is economically dense and occupationally specific.

Financial struggles during technological unemployment can be densely confined to specific people. Despite financial struggles the overall economic activities are likely to benefit from increased production efficiency which will grow GDP. Technological unemployment will generally affect specific employees (extensive margins) rather than general hours worked (intensive margins). UBI policies have shown to be an effective tool for poverty alleviation. However, the distribution of a Universal Basic Income for the alleviation of financial struggles in the situation of dense unemployment could alleviate financial struggle but would do so inefficiently compared to a conditional unemployment welfare scheme.

The substitution that is predicted by academic literature would be occupationally specific and would affect different skill levels differently. Demand for some skills will disappear but demand for other skills will develop to coexist with the demands developed by new technology. Low-skill employment will become less cognitive and more physical. However, low-skill employment opportunities would reappear relatively quickly. The disappearance of demand for high- skill specialized employment means high-skill unemployed require retraining through education to gain employment at a similar skill level. However, the effects of UBI on education do not match the needs for retraining of high-skill unemployed during Industry 4.0. As the effect of UBI on education is educational gain made by children of recipients on primary and secondary education.

Unemployment and financial struggles can occur if no new employment is found. Several UBI cases were tested if UBI increases the chance of gaining employment. No empirical evidence was found in UBI cases of UBI improving the chance of an unemployed person gaining employment. UBI cases show no statistically significant difference in gaining employment compared to conditional welfare schemes targeted at the unemployed. Even testing the employment gained of UBI compared to intensive job training programs showed no statistically significant difference at the end of the experiment. With no statistically significant difference a UBI policy shows similar effectiveness to

unemployed gaining employment as a conditional benefit scheme. However, employment gain was shown to differ between regions. Local economic booms may impact employment gain. This would mean a UBI policy does not have similar effectiveness but similar efficacy compared to conditional unemployment schemes. Furthermore, statistically significant differences in employment gain exist between the skill level of the unemployed gaining employment. Low-skill workers are able to gain employment at statistically significant higher rates than high-skilled unemployed for both a UBI policy and a conditional unemployment policy. This discrepancy in employment gained is similar to the trend in employment gain during technological unemployment. UBI would thus not aid in the challenges brought forth during Industry 4.0.

The benefits of using UBI over conditional social policies are in lessening the non-financial and non-labor market effects of unemployment. Unemployment increases the statistical risk of negative physical and psychological health effects for the unemployed. These negative health effects are related to negative health behavior (e.g. increases in alcohol and smoking), the effect of relative poverty and the negative effect on mental health. However, effects of UBI on suicide prevention and social isolation are uncertain and ambiguous. UBI has statistical significant benefits in decreasing negative health behavior and increasing healthy habits. Several UBI cases measured significant consumption changes in regard to (relative) food security. Consumption changes observed during UBI cases are in regard to food security by increased caloric, protein and vitamin intake. However, food security did not only increase by changes in consumer behavior. The Kenyan and Namibian UBI experiments show increased food security correlating with livestock investment. UBI cases show significant increases in metrics of happiness and life satisfaction when these metrics are measured during cases. In UBI cases where psychiatric disorders were measured the psychiatric disorders were reduced. Several cases measured that recipients of UBI consumed less alcohol, smoked less, and had less drug abuse. However, other cases show increases in alcohol consumption correlation with the date of UBI payouts.

Ambiguity surrounds some effects of UBI considering challenges associated with technological unemployment. UBI cases show effects against social isolation by increased social cohesion. In one case the local community formed a committee that was active in coordinating the community around UBI spending. Forming of local committees has not occurred in any other cases. Even though other UBI cases have occurred on similar local village level and with a similar level of economic development. As such the forming of committees may not be repeatable. Furthermore, ambiguity surrounds increased risk of suicide during technological unemployment. Ambiguity exists about causes of suicide in academic literature. The effect of mental health on suicide is not universally significant in literature. Likewise, academic literature tells the risk of suicide exist predominately for men. However, the effects of UBI on psychological health show no gender difference in the factor of mental health on suicide. As such, the effects of UBI on suicide prevention if mental health is a variable would likely be limited. Furthermore, loss of identity is associated with unemployment. However, UBI has shown no effect on the identity of unemployed recipients.

UBI policies have shown statistical significant effects that can assist with non-financial and non-labor market challenges brought forth during the fourth industrial revolution. UBI policies are shown to have effect on two causes associated with increased risk of ill physical and ill psychological health during unemployment. The effect UBI policies have on reducing ill health are by reducing relative poverty and reduction in bad health related behavior.

5.2 Suggestions for future research

Several gaps in academic knowledge surrounding UBI still exist. Based on Academic literature read and UBI cases studied several knowledge gaps and methodological suggestions to close the knowledge gaps will be made in this paragraph.

The effects of UBI are (almost) exclusively researched in vacuum projects with only a control group to be compared to. While UBI research does not investigate the comparative effects of different non-UBI policy approaches. This limits the gained knowledge about the relative effectiveness and efficiency of UBI in given situations. This lack of comparability not only limits academic knowledge but also limits arguments for the adoption of a UBI policy. Knowledge of how UBI compares to other policies is relevant for policy sciences and public administration as the knowledge can be used for improvements in service delivery. UBI research has provided proof of concept that a UBI can be implemented. However, proof of efficiency of UBI over existing policies and alternative policies still lacks.

UBI policy research has predominantly focused on positive effects of UBI distribution without studying the negative effects. UBI research has either focused on the effects of giving recipients additional income or observed the differences between conditional and "no- strings- attached" income policies. Although UBI research has explored the winners of UBI reforms. However, academic literature has only very narrowly and theoretically explored losers of UBI reforms. Losers of UBI reform could be people that cannot work and cannot gain additional income. As such, losers of UBI reform are people who could be completely reliant on welfare benefits (e.g. handicapped or pensioners). Likewise people that would be granted more income from welfare than from UBI would also lose out. Example being, an unemployed single parent that could receive multiple benefits like unemployment benefit, rental support, or possible child care benefit. Research has been done into transforming existing welfare policies into UBI policies or adding UBI policies. Research into complete reforms of welfare systems and which people would be affected in which manners by such a UBI policy are not extensively explored.

While unique qualities of welfare state policies differ on national levels which makes generalizations more difficult. However, this research would improve planning and modeling UBI reform by improving knowledge of the consequences of policy reform. Investigating the consequences of UBI policy reforms can help create more accurate research. Testing different UBI reform models for the different effects reform can have on recipients can improve the knowledge on UBI reform. Improved knowledge on UBI reform could give more insight into budgetary decision making of UBI losers and improve informed policy decision making of welfare and taxation reform. Empirical tests may have some ethical constraints but can use budgeting goals set forth by models to replicate income loss by UBI reform. Research can investigate if and how budgeting goals could be met and how budgeting goals affect losers of UBI in the test group. Study of the effect of budget constraints could help smoothing out bottlenecks for UBI policy adoption. Additionally, knowledge gained by studying potential losers of UBI reform and how those losers would be affected by UBI reform can improve policy reform knowledge. Moreover, data driven political and policy discussions can take place on if and how compensation policies should be made and for which groups of UBI losers compensation is deemed necessary.

Much research has been done into overall labor supply effects of UBI. However, not much is known about specific labor supply responses outside of the different responses between sexes. For instance, Moffitt (2003) argues a stronger labor supply response from higher income households would occur. Reasoning that higher income households would be more likely to reduce labor supply if a maximum income for eligibility would be introduced like Negative Income Tax (Moffitt, 2003). The effect of UBI on labor supply is not studied in regards to the labor supply effect on different

household income levels. Furthermore, research of the effect of UBI on labor supply also does not factor in variables like the age of the worker. Differences in labor supply responses can occur between older workers compared to younger workers. Younger workers may want to save for expenses like buying a house while older workers may look forward to retiring and want to decrease their labor supply. Labor supply knowledge could be relevant for possible time sharing strategies and policies to increase employment.

The labor market response has never been studied during UBI policies. Additionally, Widerquist (2005) notes the labor market response to labor supply changes of a UBI policy has not been empirically studied. The effect of reductions in labor supply on conditions of workers or wages are unknown (Widerquist, 2005). A wide scale UBI study should gather data about wage development in regards to labor supply changes. Similarly, a wide scale UBI study can also measure effects of the evolving power dynamic between employers and employees during UBI. As, Perkins et al. (2021) reason that employers may anticipate the new bargaining power of employees induced by UBI. In anticipation employers may deem measures necessary to reduce the new found bargaining power of the employees. Interviews may give more insight into the evolving power dynamic between employers and employees. Additionally, Verlaat et al. (2020) tell that a UBI experiment shows differences in likelihood of gaining employment for lower and higher educated UBI recipients. Moreover, Perkins et al. (2021) reason that higher educated employed would gain increasingly more bargaining power compared to lower educated employed workers. Closing the labor supply research gap would require gathering data about above mentioned characteristics in addition to labor supply and wage data in future research experiments. Furthermore, any effect of UBI on wage development is also relevant for the substitution of human labor during technological advancement. Autor et al. (2003) argue that cost-efficiency of machines compared to human labor as one of the main predicting variables for labor substitution.

The spillover effects of Universal Basic Income are not often studied. Despite the job creation during UBI policies being argued by different economic models like the model of Lee, Lee and Kim (2020). Nonetheless, the analysis of economic models does not go into further details of employment like the employment sector. This gap in knowledge does not allow for risk assessment if the employment that economic models predict would appear after technological demand change of employment. Neither is known if the created jobs offer longevity of employment and persist after the UBI policies stop paying out grants. Additionally, little is known about the effect of UBI on labor supply responses and how labor supply responses compare to economic models of job creation. Empirical studies of UBI should measure employment and job creation household survey perspective as well as a payroll survey perspective.

Questions also remain how policies can reduce wealth inequality. No UBI policies have shown a decrease in wealth inequality. Academic reasoning about unequal investment opportunities persisting wealth inequality was found with contrary evidence (see paragraph 5.5.2). Perhaps, research about policies that are proven to be effective to reduce wealth inequality should be studied. After a study into wealth inequality reducing policies, UBI could be reevaluated for purposes of wealth inequality.

5.3 Suggestion for policy strategy and policy design

The implementation of a UBI policy brings several choice opportunities policy makers can choose to increase known effects of a UBI policy.

Different payment periods and timings increase different effects of a UBI policy. Policy makers can for instance choose between monthly payments or lump-sum annual payments. The benefits of using monthly payments according to Watson et al. (2019a) is that monthly payments would reduce substance abuse cases and lessen the policing needs and emergency care associated with substance abuse. However, according to Haushofer and Shapiro (2016) the usage of lump-sum payments has an advantage over monthly payments in that lump-sum payments have higher rates of asset retention. UBI studies with different payout policies showed that recipients of lump-sum UBI payments had significantly higher rates of investing in home upgrades (Haushofer & Shapiro, 2016). How recipients use the payment can be particularly influenced for larger lump-sum payments. Structuring the UBI payment around certain expenses can nudge the usage of a recipient its use of the UBI payout. For instance, planning the UBI payment ahead of school tuition expenses can nudge the UBI payment into being used for tuition payments (Barrera-Osorio et al., 2008). A government can strategize on the use of nudging for a UBI policy. A government that schedules subsidy policies to be available during the payout of lump-sum UBI payments can extend the reach of a subsidy policy. Moreover, by planning subsidy policies around an influx of disposable income a wider and more equal opportunity to participate in the subsidy for lower income households could be created. Currently the use of subsidies can be predominantly by higher income households. For instance, a Dutch report by Rovers, Kooger and Tichelaar (2021) argue that subsidies for isolating houses were disproportionately used by higher income households. The largest household group benefiting from the isolation subsidy had incomes higher than the median household income with medium income households making up the second largest group of subsidy users (Rovers et al., 2021).

Adding choice opportunities which open around a UBI payment date may nudge social peer-influenced spending towards what Harold Watts describes as ‘’on sale’’ subsidies (Widerquist, 2005, p. 57). Peer-influence in spending was both observed during long lasting UBI cases and short lived UBI cases. The long lasting case of UBI seen in Alaska saw wealthier households having a high degree of peer-influenced Marginal Propensity to Consume (MPC) after pay-out. Contrary to this, peer-influence in briefer lived cases saw that the known payment date of UBI influenced peer-pressured borrowing behavior. The Kenyan UBI case suggests that arguments for investment were socially accepted to deflect peer-pressured borrowing requests from family and friends. Example being by offering a subsidy on solar panels around the payout day of a UBI. The UBI policy can allow more equal access for investments by influx of capital. Moreover, offering limited time spending opportunities may curb peer-influenced spending. Furthermore, the social costs of UBI policies can decrease if the recipients are nudged into an investment with social benefits (like green energy) so that more public good can be created.

The conclusion finds UBI inefficient for reducing poverty. The monetary inefficiency of UBI for poverty reduction does not mean the positive effects of UBI cannot be used to adapt other policies. A door is left open to change social policies now that UBI shows no significant difference in effect on gaining employment compared to conditional welfare policies. Changing existing welfare schemes to a (more) no strings attached model could have positive health effects for the mental and physical health of recipients. As UBI has shown that requirements during existing welfare programs do not statistically significantly aid employment gain while having a comparatively negative effect on

mental and physical health. The conditional requirements of welfare programs may only enforce a sense of reciprocity from a societal perspective. Robeyns (2018) argues that reciprocity in social systems is to prevent freeriding. Torche and Valezuela (2011) argue that reciprocity and trust balance each other out in social networks. As such the need for reciprocity may be out of lack of (altruistic) trust in others and the desire to prevent freeriding. Implementation of an unconditional policy like UBI requires a high degree of social trust.

Experiences with direct cash transfers like UBI have shown positive results like reducing poverty and hunger in developing nations. Mnif et al. (2018) tell that developing nations as importers of technology differ from the economic theory of compensation. The difference for developing nations during technological shock on employment are positive short term effects on job creation followed up by negative long term effects on job creation (Mnif et al., 2018). Research results of UBI from developing nations show results in reducing poverty in a long-lasting manner by investment in livestock and increases in education reach and health. Poverty was reduced during UBI cases in developing nations and food security was increased. Example is that Haarmann et al. (2009) argue that during the Namibian UBI case malnutrition was reduced from 76% of recipients to 16% of recipients. Moreover, the school pass rate of children increased from 40% to 90% after one year of UBI (Haarmann et al., 2009). Furthermore, the Namibian UBI case saw access to the local health clinic fivefold during the UBI experiment (Haarmann et al., 2009). A follow-up study done after the Kenyan UBI case found that 3 years after the UBI experiment had ended former recipients had retained the equivalent of 60% of the original wealth transfer by asset investments in home upgrades and livestock (Haushofer & Shapiro, 2018). However, the benefits of UBI for development aid are not only result oriented but also distribution based. According to Yanes (2019) mobile technology allows for developing nations to participate without developing landline infrastructure. Mobile technology offers access to banking services in the poorest regions (Yanes, 2019). Direct distribution via systems like M-Pesa offers opportunities to avoid distribution problems.

A challenge low-skill unemployed workers may face is job searching competition from middle-skill workers (Autor and Dorn, 2013). Middle-skill workers require training to bridge the skill gap to regain similarly skilled employment according to the compensation theory (Mnif et al., 2018). Retraining may not only be important for middle-skill workers but also lessen competition for low-skill employment opportunities. However, the potential retraining of middle-skill unemployed workers could consider the economic viability of the training. Aspects like the potential length of career after retraining could be considered. Additionally, innovation of new technology would give all unemployed additional barriers in adapting to the new technology present in the workplace. Long term unemployed may find adapting difficult and could require technology training.

The labor supply response has been a concern of policy makers since (at least) the first Negative Income Tax (NIT)-experiments. However, the largest effects seen on labor supply (particularly of women) have been driven by the factor of child support policies and not UBI policies. Data from Prescot, Swidinsky, and Wilton (1986) or Heckman (1974) suggest child support or daycare policies would have a significant effect on increasing labor supply (particularly of women). Other policies like childcare can be used to compensate for side-effects of a UBI policy such as the labor supply response. Furthermore, reductions in labor supply may have some upsides during high unemployment. As reducing labor supply with unchanged demand for labor creates more employment opportunities.

Technological advancements of Industry 4.0 will also change the value of many facets of the global value chain according to Kovacs (2018). Moving up the value chain is staple in (local) development planning (Herrschel, 2013). The technological shock on production can affect local companies. Additionally, the value multiplier of local employment opportunities can also be affected. Based on the meso-economic academic literature about technological shock a few suggestions on

local development strategy can be offered. The main change of industrial revolutions is the advancement in production efficiency. Innovation in production often drives employment growth while production enhancements cost employment. Competitiveness in market dynamics causes innovation to be adopted across a sector. Production companies and workers in the middle of the value chain will likely be heavily affected. Cyber-physical systems (CPS) may also affect production efficiency in lower parts of the value chain. Sector wide adoption can in turn affect employment if product demand remains unchanged. Once firms start cutting employment they enter a vicious cycle of future employment cuts. Firms that invest in technological development see employment growth. However, firms only increase employment in the long term based on R&D investment, wages paid, sales performance and strategic management. Strategic local development should focus on firms developing technology. Technology oriented jobs will be in higher demand. Development can include an educational development focus for acquiring training centers and promoting training in technology oriented jobs. However, other subjects and levels of education can still increase the laboring capacity of a worker. Increased laboring capacity will allow workers to adjust to a greater variety of work. Even when vocational training is not directly used for employment, it still improves employment opportunities. Where Industry 4.0 offers another opportunity for local development is that CPS will reduce the dependency of cost efficiency on lower wage workers. The shift in the value chain will likely be away from low wage workers and towards business friendly climates with availability of high-skill technical occupation. Governments can not only preemptively nudge education more towards technical professions but also create a business friendly legislative environment. For instance, the legislative ease of entering the market and reliability of legal systems may become more important factors for production locations than low wage workers. The importance of infrastructure as an investment factor is likely to remain.

Even though the policy is called universal basic income, several examples saw limited reach of universally intended cash policies. The soft entry barrier of technological knowledge was never found to be limiting during the comparative case study. Hard entry barriers that can be placed intentionally or non-intentionally were the causes for exclusion. Hard barriers can be seen as bureaucratic requirements and may particularly impede intended distribution in the short turn. Example being the CARES act that required recipients to have filed taxes in the previous year for eligibility while low income households were exempt from the obligation to file income tax. This exemption caused administrative bureaucratic problems for eligibility for low income households. Intentional hard barriers limit participation for e.g. children, non-citizens or prisoners to UBI policies. Framing of the policy in adjustment with the intended policy goal will be important when making decisions on intentional hard barriers. A UBI policy which seeks to grant opportunities as social investment can be linked with opportunities granted to future generations and may include children. A UBI policy that seeks to reward or compensate the general population may exclude non-citizen residents. Moreover, policies aimed at poverty alleviation may want to include non-residents and people with a criminal past due to the larger probability of poverty. Policy framing and decision for hard intentional barriers can be heavily influenced by the political environment. With reciprocity as conservative beliefs likely to favor rewarding members of society, while liberal political beliefs favor a right to an income.

5.4 Limitations and obstacles

Several factors exist that limit the extent and possible accuracy of the research.

The case selection uses both experiments and policy applications of UBI. Generally speaking, the analysis of experiments does offer a more statistical analysis of the effects of UBI by purposeful data collection and control groups. Even though the quantitative data from different cases are differently operationalized and do not offer a perfect comparison. Still, policy applications of UBI can offer insights into larger scale effects (e.g. labor market effects), qualitative roadblocks and pitfalls for the policy adoption and application of a UBI policy.

Data availability in some UBI cases was limited. Not all UBI policies that are implemented are entirely evaluated. E.g. policies with appeasement as goal offer less insights via policy evaluation. The conceptualization and operationalization of experiments limited what data was available. E.g. older experiments cannot recollect data about relevant UBI effects that were found from future insights in later experiments. Moreover, the timeframe of ongoing experiments and policies means that not all data is available at the time of this research. For instance, in the case of the Korean YBI experiment only the first year of data is currently available (in English). Effects and insights into UBI cases may change in the future. Furthermore, data about policy case studies was limited due to reliance on publicly available data at the time of this research. The availability of publicly available data changes with the passing of time. Not all data about events are retained. This was particularly limiting for case studies of older policy implementation like Kuwait or Australia.

Not all data was optimized for the third sub-research question considering the effects of UBI on the unemployed. Many effects of UBI considering the challenges the unemployed face during Industry 4.0 were observed based on a general population receiving Universal Basic Income. Only the Dutch and Finish UBI experiments exclusively consisted of unemployed participants. Likewise data cited in paragraph 4.3.1 about monetary efficiency by Aylward et al. (2021) also consisted exclusively of unemployed recipients. The arguments that can be affected by the lack of the exclusive focus on unemployment concerns the effects of UBI on the challenges of ill physical and psychological health during unemployment.

The technological changes and their effects are predicted based on academic literature. Volatility in technological development limits the accuracy with which this research can predict the effect of technological change. However, past academic predictions have been disproven by recent technological developments. Past performance is not a guarantee for the future.

Time constraints did not allow the inclusion into the research of all (quasi-)UBI policies and experiments. Moreover, the technological change during Industry 4.0 that affects unemployment is not a well-defined problem. Academic literature on the effects of technological development during Industry 4.0 can be ambiguous. Researching the challenge of technological unemployment has added research time.

5.5 Discussion

The paragraph for the discussion seeks to elaborate on the implication of the results and what the results mean for the possible UBI policies. After that the discussion focuses on the implications for academic literature about UBI on the basis of the effects seen in cases during the comparative case study of this research. Next, the discussion will go into policy aspects of the comparative case study concerning management and legitimacy pitfalls of UBI policies from a public administration perspective. Finally, the conception of a post-work future popularized in academic UBI literature will be touched upon.

5.5.1 Implication of results

The conclusion of this research states that UBI would be monetary inefficient compared to a conditional welfare scheme. This conclusion finds new evidence for the hypothesis of Hoynes and Rothstein (2019) about UBI's efficiency compared to modern welfare state systems. Considering the use of UBI for social protection Gentilini et al. (2021) argue in a World Bank report using a different case selection of UBI cases from this research that UBI reaches 60% of the efficiency of existing poverty reduction programs. Despite that UBI policies may be inefficient in a developed welfare state, countries with a less developed welfare system and where a large part of the population is at risk of poverty may find a UBI policy useful to reduce poverty.

One element this research does not cover is if a UBI can affect geographic mobility related to unemployment. Geographic mobility may be required as new employment opportunities may not arrive in every geographic area. No UBI case showed any effects of UBI increasing geographic mobility of recipients. Furthermore, the ongoing COVID-19 pandemic has seen an increase in working from home as opposed to working from an office. As such, reasoning that the geographic gap for employment opportunities will be less impactful is logical. However, as academic literature points out, new low-skill employment opportunities after technological unemployment are predicted to be increasingly physical. As such, the geographical gap may particularly impact low-skill unemployed.

Advancements like AI are predicted to improve the efficiency in public administration. The concerns of improved efficiency and following technological unemployment during Industry 4.0 cause conceptions that a more efficient and bare-bones system of public administration is needed. However, the conception of designing a bare-bones system of public administration like UBI is contradictory when advancing technology could likely handle more complex systems while reducing the costs associated with executing such a system. If administration costs are the main concern of advancing technologies then an AI driven system would also be a bare-bones system of public administration and hardline economic management.

Strategic planning is concerned with the disruptive effects of technological advancement. However, the opportunities of using these advancing technologies to alleviate the disruptive effects are not discussed. Academic literature from Ghatak and Maniquet (2019) argue that an advanced information driven taxation system would legitimize UBI via efficiency in poverty reduction. This research and research from Gentilini et al. (2021) both conclude that conditional welfare would be more efficient in poverty alleviation than a UBI. By the same token, an AI driven system of public administration may outperform a UBI policy in efficiency.

5.5.2 Implications for academic UBI literature

Comparing the studied UBI cases in this research to the academic literature about UBI reveals some overestimations of effects in the literature. The academic literature about UBI is often theoretical or draws conclusions about the effects based on singular cases of a UBI policy or experiment.

In academic literature about UBI that focuses on the aspect of UBI as in-cash transfers recognizes squandering as a possible. Hamiton and Martin-West (2019) argue on the topic of squandering that results of a UBI case show less substance abuse associated with UBI. However, this research its larger case study reveals squandering on alcohol happens surrounding the payout date of UBI.

Furthermore, the academic literature from Goldsmith (2001) suggests UBI will decrease wealth inequality overtime by redistributing income. However, no UBI cases of this case study show a definitive durable decrease in wealth inequality. Furthermore, analysis of spending behavior of Alaskan UBI by Kueng (2018) shows contrary spending behavior to what Kozminski and Beak (2017) argue in academic literature to be the cause of persisting wealth inequality. Kozminski and Beak (2017) argue that richer households use the UBI as investments for future wealth. However, analysis of spending behavior by Kueng (2018) shows increased discretionary spending by wealthier households and budgeting by less wealthier households.

Moreover, academic literature by De Wispelaere and Stirton (2016) argue about the implementation by technology being limiting to the universality of UBI. The cases studied in this case study show little effect of technology limiting the reach of UBI policies. Contrary to this, administrative barriers limited the accessibility of UBI policies more compared to technological barriers in the cases of the UBI policies studied. In cases where UBI required the use of non-widespread systems, it is likely that social assistance of others helped bridge the technological gap of the technologically impaired. However, the reliance on social assistance to bridge the technological gap can weaken the empowerment that a UBI income aims to provide.

Hamilton and Martin-West (2019) argue about the economic effects of UBI and the ability of UBI to produce economic growth while running at a budgetary deficit. UBI cases studied show that ad hoc (near-)universal direct cash policies for crisis situations were used to maintain spending when economic downturns were predicted to happen. However, the Ricardian equivalence of direct cash policies suggest that UBI does not induce spending but rather accelerates spending. Later decreases in for instance interest rates show UBI policies accelerated future spending.

Furthermore, the creation of jobs or economic growth by multiplier effects of a UBI policy has been argued in cases based on models such as by Lee et al. (2020) or Nikiforos et al. (2017). Short term empirical multiplier effects were observed by Haarmann et al. (2009). However, empirical research has not seen economic multiplier effects that were retained beyond the UBI payout period. Best example being the follow-up study from Haushofer and Shapiro (2018). Haushofer and Shapiro (2018) found that people affected by spillover effects had significantly less wealth compared to the control group 3 years after the UBI payouts ended. Most longevity of UBI payments was found for former recipients who had invested in assets like home upgrades (Haushofer & Shapiro, 2018).

Additionally, while UBI is argued to create jobs UBI would simultaneously reduce the labor supply of other workers. For instance, Bibler, Guettabi and Reimer (2019) found the effect that every 1,000 USD increase in the payout of UBI would increase the chance of finding employment for an unemployed adult by 1.8%. However, by the same token every 1,000 USD increase in UBI payments decreased labor supply by 0.7 hours per week for men, and 0.9 hours per week for women (Bibler et al., 2019). The decrease in labor supply that UBI induces makes the policy less efficient from an economical perspective.

5.5.3 UBI management and legitimacy

Strategic management in public administration aims to maximize public good during choice constraints while using sources of support and legitimacy (Moore, 1995). However, management of UBI policies does come with pitfalls for legitimacy.

Cases of UBI policies have shown that once UBI policies are in use that many recipients experience receiving and being able to decide how to spend their UBI as more positive than other government spending. Furthermore, the existence of the UBI policy gives and confirms a right to income to the recipients. Changes that negatively affect the UBI policy can reduce legitimacy and will make reforms for other public good increasingly difficult. Example being a necessary budgetary reform in Alaska of the Permanent Dividend Fund. Ultimately reforming the UBI policy was unpopular and as such the economically important university budget was reduced by 41% instead of changing the UBI policy.

Policy implementation of UBI can be based on the distribution of profits of finite natural resources (like Alaska or Mongolia) or prosperity of economic booms (e.g. Macau). The influx of money to the budget of public administration is finite. Distribution of the politically controlled resources via UBI limits the spending on other more sustainable public good. Examples being diversifying the economy for a period after the finite resource is depleted or securing sustainable energy sources for future generations.

UBI policies have also been used to gain legitimacy as appeasement policy. UBI can be effective as an appeasement policy. UBI experiments in Finland and Korea both showed increases in trust towards politicians after recipients received UBI payments. However, the legitimacy from appeasement can quickly fade away. As recipients view the value of appeasement by UBI as relative compared to other benefits offered. If other governments distribute UBI payments of greater value then the perceived value of a UBI can diminish in comparison. Examples of this can be seen in the inter-governmental bidding competition as seen in the case of Macau and Hong Kong for the year 2011 and the years thereafter.

5.5.4 A post-work future

A post-work future is a future where human labor is no longer required. Academic literature like the price measurement hypothesis of Autor et al. (2003) argue that cost efficiency of machines will replace the need for human labor. Academic literature from Mathers (2019) discusses a post-work future where robots work physical jobs and human labor is increasingly cognitive labor. Mathers (2019) discusses elements of meaningless and unfulfilling work and how UBI would affect human labor in such a future. Such visions of the future are in contrast with economic academic literature. Mnif et al. (2018) argue that technology replaces low-skill cognitive jobs with physical jobs. Technological advancement will change demand for the type of labor and not replace demand for labor (Mnif et al., 2018). The post-work literature about UBI is not holistic by omitting trends from other fields of academic literature. Post-work literature is closer to a utopian vision of the near future than a realistic vision. Furthermore, Baxter et al. (2012) tell that the irony of automation is the increased dependency on technology which creates higher demand for more well trained technicians as a last line of defense against the inevitable technical failures. Additionally, advancements in technology change human demand for resources and luxury rather than creating contentment with efficiency and reduced workloads (McGaw, 1984).

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Appendix 1:Case study

United States – Negative Income Tax experiments (1968-1980)

The Negative Income Tax (hereafter NIT) experiments took place during the 1970s in the states of Indiana, Iowa, New Jersey, and North Carolina, and in the cities of Seattle (Washington state) and Denver (Colorado state). NIT was also called guaranteed basic income (Burtless, 1986). The NIT-experiments are seen in a modern contemporary view as early UBI experiments (Gentilini, et al., 2021). Table 5 gives an overview of the characteristics of each Negative Income Tax experiment.

Table 5: Overview of NIT-experiments in 1970s U.S.

Name:	Location(s):	Year:	Sample size: Initial (Final)	Sample Characteristics:	G*	t**
The New Jersey Graduated Work Incentive Experiment (NJ)	New Jersey & Pennsylvania	1968-1972	1,216 (983)	Black, white, and Latino, 2-parent families in urban areas with a male head aged 18-58 and income below 150% of the poverty line.	0.5 0.75 1.00 1.25	0.3 0.5 0.7
The Rural Income-Maintenance Experiment (RIME)	Iowa & North Carolina	1970-1972	809 (729)	Both 2-parent families and female-headed households in rural areas with income below 150% of the poverty line.	0.5 0.75 1.00	0.3 0.5 0.7
The Seattle/Denver Income-Maintenance Experiments (SIME/DIME)	Seattle & Denver	1970-1976, (some to 1980)	4,800	Black, white, and Latino families with at least one dependent and incomes below $11,00 for single parents, $13,000 for two parent families.	0.75, 1.26, 1.48	0.5 0.7, 0.7-.025y, 08-.025y
The Gary, Indiana Experiment (Gary)	Gary, Indiana	1971-1974	1,799 (967)	Black households, primarily female-headed, head 18-58, income below 240% of the poverty line.	0.75 1.0	0.4 0.6

** G = the Guarantee level* *** t = the marginal tax rate* *Reproduced form Widerquist (2005)*

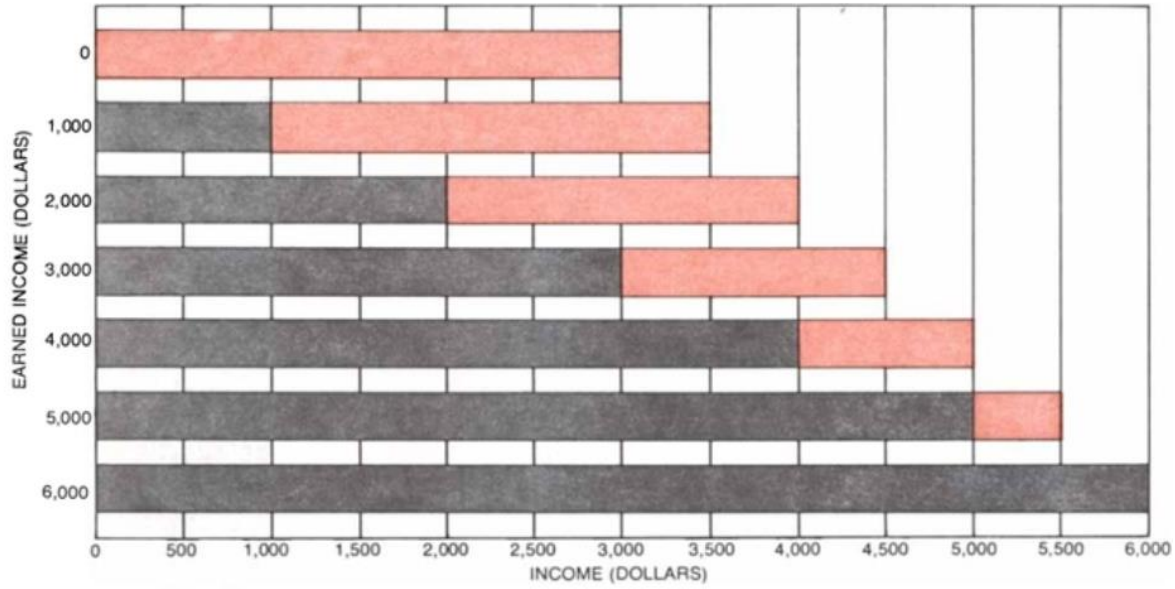
The experiments use the policy of NIT that differs from a UBI policy. NIT differs from UBI in that income is redistributed via income taxation to people with an income below a certain threshold. The NIT policy used a progressive taxation (as shown in figure 4) scale which aimed to reward having a higher income and thereby incentivize work.

The experiment used selective sampling which targeted poorer households. While these poorer households would likely be affected by an NIT policy. However, Widerquist (2005) argues that by using targeted sampling the NIT-experiment does not accurately represent what a universally applicable NIT-policy would be like. Likewise, the run time of the experiment incentivizes the use of the NIT-policy. Harold Watts in Widerquist (2005) describes it as putting leisure time ''on sale'' (p. 57). The limited timeframe incentivizes consumption during that window. Robbins (1984) notes that

the SIME/DIME experiment in Seattle and Denver was meant to have a run time of 20 years but was canceled after 9 years. While Widerquist (2005) notes the SIME/DIME experiment could have examined the evolving cultural and social behavior norms towards the NIT-policy. However, Widerquist (2005) argues that it is unknown if the participants believed the experiment would have lasted 20 years or believed the runtime would be cut short. Neither is known if the participants their behavior was tailored to the belief the runtime of the experiment would be 20-years or the runtime would be cut short. Additionally, it is not known if participants fully comprehended the NIT-rules nor was inspected if the reported income were correct (Widerquist, 2005). The downsides of the use of self-reported income is frequently brought up in recent arguments surrounding the NIT-experiments in the United States (Bergman, 2016; Matthews, 2014). Burtless (1986) notes that the original choice for the self-reported income methodology was stated to diminish the lag of data. As income data would lag behind by 18 months if data from taxation authorities was used (Burtless, 1986).

Figure 4: Negative Income Tax Rates New Jersey experiment

The black part of the bars represents pretax income and red part of the bars represents NIT



Taken from Kershaw (1972)

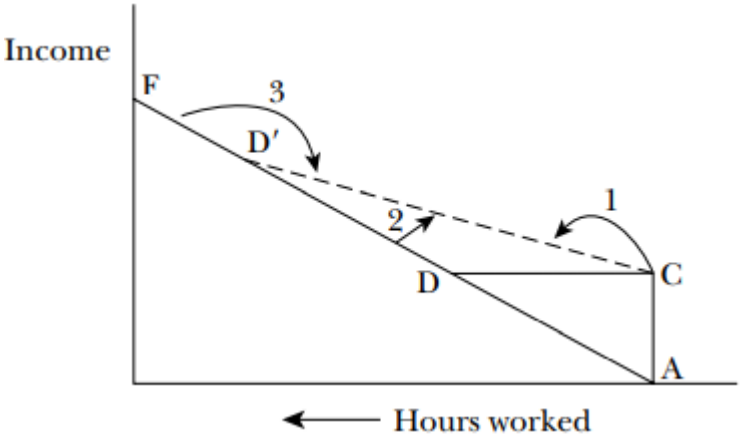
The NIT-experiments focused on poverty alleviation and were part of the Nixon administration its War on Poverty. The NIT-experiments served as a trail for a larger NIT-policy (Bergman, 2016). The experiments saw 7,500 Americans receive 1,600 USD (10,000 USD adjusted for inflation) and had several objectives. The first research objective was finding out if people would work less in response to a NIT-policy. Additionally, the research goal was to discover if a NIT-policy would be affordable. Furthermore, the research had the goal of finding out if a NIT-policy would be politically feasible (Bergman, 2016; Matthews, 2014).

Contemporary academic literature describes similar goals of NIT-policies compared to goals of UBI-policies. The NIT-policies also sought to reenvision welfare delivery by transforming the means-test of welfare benefits to would-be welfare recipients for similar reasons as UBI. Tobin, Pechman and Mieszkowski (1967) note in the goals of NIT-policies to be a more effective welfare delivery due to the poorest not claiming welfare from indignities of the welfare administration. Moreover, NIT-policies sought to reduce wasteful spending due to NIT being distributed systematically via taxation (Tobin et al., 1967). Similar to the in-cash UBI, NIT transformed recipients of in-kind benefits into consumers.

Analysis of the NIT-experiments mainly focus on change in willingness to work (a.k.a. labor supply). The change in work reduction was a main concern prior to the NIT-experiments (Tobin et al., 1967). Widerquist (2005) notes the NIT-experiments did find a statistically significant reduction in labor supply. Empirical results for the reduction of labor supply differ between NIT-experiments and academic studies observing the results. Widerquist (2005) argues that the overall reduction in labor supply ranges from -0.5% to -9% for husbands, or about 0.5 to 4 hours per week, 20 – 130 hours per year. Wives tend to reduce their labor supply by a range of 0-27% and single mothers by 15-30%. The wide range in response to labor supply is widest from wives. However, the labor supply result of wives is driven by the study done in Gary (and Winnipeg [Canada]) (Widerquist, 2005). Several other studies that use different methodologies report different labor supply effects. Burtless (1986) uses the average results of the RIME and NJ experiments and weighted data from the SIME/DIME and Gary experiments. Burtless (1986) argues that the labor supply reaction for husbands was -5%, or -119 hours a year, for wives -21,1% or -93 hours a year, and for single mothers -13,2% or -79 per year. The reaction to labor supply with the data from Widerquist (2005) differed from Burtless (1986) mainly on the labor supply reaction of single mothers. Keeley (1981) argues based only on averages that a 7.9% reduction in the labor supply of husbands occurred. Similarly, Robbins (1985) argues the labor supply reaction of husbands saw a reduction of 5% or 89 annual hours worked. Additionally, Robbins (1985) argues the labor supply of wives was reduced by 117 hours per year and the labor supply of single mothers was reduced by 123 hours on a yearly basis. Widerquist (2005) notes the effects of NIT on labor supply have statistical significance. However, Widerquist (2005) argues that the effects on labor supply were not as large as imagined by critics, but too large for UBI advocates to ignore.

Discussion surrounds the interpretation of the labor supply results. Moffitt (2003) argues the effects of NIT on the willingness to work are ambiguous. The NIT experiments done in the United States in the 1970s increased willingness to work for some groups (Moffitt, 2003). The effect of NIT on willingness to work is schematically represented in figure 5. Moffitt (2003) argues willingness to work particularly increases if the recipient can increase their income. The increase in income occurs near the lowest income point where recipients receive more income from NIT but benefit more from working (point C and arrow 1 in figure 5). While people earning an income just above the rate at which these people would receive NIT consider working fewer hours to benefit from NIT (from point F to point 3) (Moffitt, 2003). Examples of what this means for the willingness to work results are that NIT increases willingness to work for people that would otherwise receive welfare. While people above the welfare standard would work less to benefit from NIT.

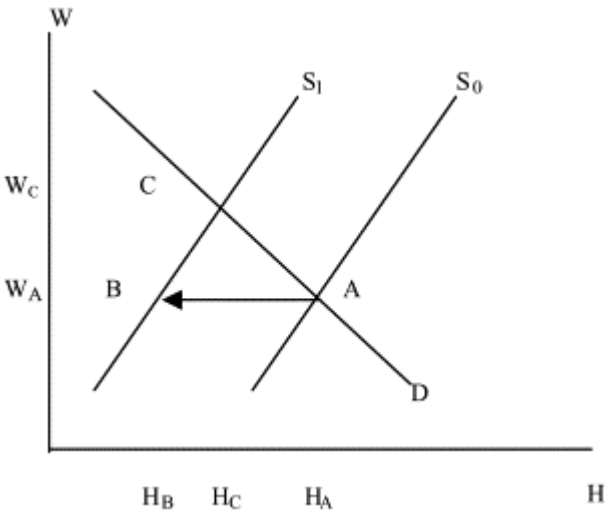
Figure 5: Negative Income Tax on willingness to work



Retrieved from Moffitt (2003)

While the experiments can measure the labor supply reaction of an individual. However, the experiment cannot measure the market reaction to NIT. Widerquist (2005) argues that while individuals decrease their labor supply seen in figure 6 from A to B, a new market equilibrium would be found for wages at C. Reducing the supply of labor (to B) means employers increase wages to Wc. This increase in wages would partially offset an income decrease from a decrease in working hours. However, Widerquist (2005) argues that for a market to respond to the change in labor supply the change needs to be in a large enough quantity. This large quantity of labor supply was not present at the scale of the NIT-experiments. Additionally, while data was gathered on labor supply no data is available on wages to measure the market response (Widerquist, 2005).

Figure 6: Labor supply and wage equilibrium



Retrieved from Widerquist (2005)

The original goals of the NIT-experiments were not only to investigate the labor supply effect but also investigate the affordability and feasibility of an NIT-policy. Several studies have investigated the feasibility and affordability after accounting for the labor supply response and came to widely different conclusions. To give a few examples: Rees and Watts (1975) argue the labor supply response would add 5 to 10% to the estimated tax costs of an NIT-policy. Ashenfelter (1978) argues the cash grants and operation of an NIT policy would be 78% of the costs and 22% of the costs would be induced by labor market effects like the reduction of labor supply. Ashenfelter (1978) argues the

reduction in labor supply would increase the tax costs by 28% of the overall cost. Burtless (1986) argues that the reduction of labor supply would triple the tax cost of an NIT program.

Summarizing, Negative Income Tax (NIT) experiments were held in the United States during the 1970s in several cities and rural locations. NIT offers a minimum income guarantee, the amount of the guarantee differed per experiment. The NIT experiments have had a significant effect on labor supply. Different studies found different results. However, generally the labor supply reduction was weakest for husbands, second weakest for single mothers, and wives had the strongest reduction of labor supply. Rural areas showed a smaller reduction in the labor supply of wives. While the effects on labor supply are significant the effects are not as disruptive as speculated before the experiments. Furthermore, the labor supply reduction may be primarily driven by higher-income households while lower-income households increase their labor supply. However, none of the experiments can simulate the wide scale labor market effect nor the long-term effects of NIT. Labor effects could result in an increase in wages. Nonetheless, the NIT experiments get dismissed by sampling biases.

Canada - Manitoba (1975-1978)

Canada during the 1970s did an experiment with Negative Income Tax (NIT) which was inspired by the NIT-experiments in the United States. Table 6 gives an overview of data about the experiment. The experiment was prompted by an analysis from the Economic Council of Canada in 1968 and the Special Senate Committee on Poverty in 1971 (Simpson, Mason & Godwin, 2017). The experiment had two goals. The first goal was according to Hum, Laub and Powell (1979) to *''evaluate the economic and social consequences of an alternative social welfare system based on the concept of a negative income tax''*(p. 1). Simpson et al. (2017) tell the second goal implicitly formulated by the design documents was to understand the administrative and logistical challenges involved in implementing such a system across a population.

Table 6: Overview of NIT-experiments in 1970s Canada

Name:	Location(s):	Year:	Sample size:	Sample Characteristics:	Guarantee	t*
The Manitoba Basic Annual Income Experiment (Mincome)	Winnipeg and Dauphin, Manitoba	1975-1978	1,300	Families with, head younger than 58 and income below $13,000 for a family of four.	C$3,800 C$4,800 C$5,800	0.35 0.5 0.75

** t = the marginal tax rate* *Reproduced from Widerquist (2005)*

Evaluation of the economic consequences was one of the main goals of the Mincome experiment. However, Simpson et al. (2017) argue no immediate study was done into the effect NIT had on labor supply. Research into the labor supply effects of the Mincome experiment occurred after the experiment was concluded and the ISER database of the result was opened in 1985 (Simpson et al., 2017). Hum and Simpson (1993) describes the overall effects of the Mincome experiment as modest. Simpson (1993) argues that results show increases in labor supply being 1 percent for men, 3 percent for wives, and 5 percent for unmarried women. The labor supply results are deemed statistically insignificant when time effects are controlled for (Hum and Simpson, 1993). Hum and Simpson (1993) describe the effects found on labor supply as *''smaller than would have been expected without experimentation''*(p. S287).

The strongest effect on labor supply was seen in households with preschool children. Labor supply changes of parents with preschool children saw decreases in the labor supply of wives and increases in the labor supply of husbands by the same amount (Heckman, 1974). Similarly, Prescot, Swidinsky, and Wilton (1986) argue based on the baseline data from the Mincome experiment that the labor supply of women in lower-income households was strongly affected by child care costs for children younger than 6-years-old. Another factor that can negatively correlate with the labor supply of women is the income of the husband while the variable of formal education only affected the wages women earned and not their labor supply (Prescot et al., 1986).

The economic and social impact of guaranteed income from the Mincome experiment were small and the long-term effects are uncertain. Simpson et al. (2017) argue Mincome affects the time of consumption but not the consumption. Likewise, Hanushek (1986) argues income spent on housing is very inelastic. Moreover, Hanushek (1986) argues that although for the time of the experiment Mincome produced more schooling for children, the long-term effect of this spending is unknown. Hanushek (1986) reasons that long-term effects lower market value of increased schooling and diminishes the earning capabilities of investing in education. Similarly, Metcalf (1973) notes that the short-term of the Mincome experiment can in no way predict the long-term effects of guaranteed income.

The researchers during the Mincome experiments aimed to improve on the methodology of previous NIT-experiments done in the United States. However, Simpson et al. (2017) tell that the researchers had a contradictory interest to legitimize the expansive experiment. Simpson et al. (2017) argue that the political need for interim results that aimed to legitimize the experiment resulted in the costs and thereby the efficiency of the experiment being negatively represented. Simpson et al. (2017) tell that later evaluations of the experiment shows much of the expenditure was paid via payments and not overhead costs.

The preliminary data that showed a decrease in labor supply caused a decrease in the political justification for the experiment. Simpson et al. (2017) tell the Mincome experiment reduced labor supply in the short term. However, labor supply adjusted in the long term (Simpson et al., 2017). Simpson et al. (2017) reason the decrease of labor supply may come from an individual close to retirement or income maintenance may help people fill up skill gaps to gain higher paying employment. To the contrary Hauseman and Wise (1979) did find recipients using the additional Mincome income to gain short-term benefits. Furthermore, participants that used these short-term benefits were less likely to exit the lower income eligibility. Although, the participants that focused on short term benefits had little statical impact on the overall labor supply response (Hauseman & Wise, 1979).

The Mincome experiment found different effects on labor supply in urban and rural areas. Calnitsky (2016) argues that participants in rural areas had a more favorable view of the Mincome negative income experiment. The favorable view was mainly due to negative income not singling-out participants or stigmatizing participation. Calnitsky (2016) argues based on data from the rural village of Dauphin that rural participation in the Mincome experiment was reduced by 11.3% compared to the control group. This decrease in participation indicated that rural participants were able to gain new income to rise above the eligibility threshold (Calnitsky, 2016).

Lastly, Simpson et al. (2017) that the Minicom experiment resembles the social-economic situation during the 1970s and may not be representative of the current Canadian society.

Summarizing, the Canadian negative income experiment sought to improve on the research done in the United States NIT-experiments. Nonetheless, researchers found that there was no significant overall response to labor supply. However, in the rural areas the guaranteed income proves to have strong positive effects with a 11.3% increase for Mincome participants to climb out of poverty. Furthermore, the most significant decrease in labor supply was found in wives with preschool children while the most significant increase in labor supply was by husbands with preschool children. However, single mothers showed no response in labor supply. The response to labor supply is likely influenced by the social-economic situation of the time the experiment was conducted and may not be representative of current society. The extra income of the Mincome experiment seemed to have little effect on housing spending. However, spending on education for children increased during the short time frame of the experiment.

Australia – Great Recession (2008-2009)

Most economic systems went into recession during the Great Recession in 2008. However, the Australian economy avoided recession while using a direct one-time near-universal cash handout as part of the economic stimulus. Hudson (2009) tells that among the 42 billion Australian Dollars (AUD) budget of the February 2009 stimulus was a 12.7 billion AUD costing policy that would distribute tax-free money to 8.7 million eligible Australian workers. The February 2009 fiscal stimulus was the first time direct cash transfers were used as a fiscal stimulus. As the earlier 10 billion AUD fiscal stimulus of October 2008 did not utilize direct cash transfers as part of the fiscal stimulus strategy (Hudson, 2009).

The amount received by the fiscal stimulus by each worker was progressive and was based on the workers income. Hudson (2009) tells that workers earning up to 80,000 AUD annually would receive a 950 AUD direct cash transfer. While workers earning between 80,000 AUD and 90,000 AUD per year would receive a 650 AUD direct cash transfer. Furthermore, workers earning between 90,000 AUD and 100,000 AUD annually would receive the lowest amount of direct cash transfer of 300 AUD (Hudson, 2009). Additionally, Hudson (2009) tells the February stimulus also contained a 950 AUD direct cash stimulus for families with school-going children between the ages of four and 18-years-old. The cost of this family stimulus policy was 2.6 billion AUD and the policy is estimated to have covered 2.76 million children in 1.5 million families (Hudson, 2009).The fiscal stimulus policy saw the government giving an average of 900 AUD directly to each Australian worker (Alexander, 2013). More than 80% of the Australian working population and 90% of Australian households received fiscal stimulus payments worth 4-5% of the average annual Australian income (Hyslop, 2014).

The Australian Fiscal stimulus differs from a UBI by being a temporary one-time payment. Additionally, the Australian fiscal stimulus policy differs from a UBI policy in that the fiscal stimulus policy is an ad hoc crisis policy. The Australian fiscal stimulus policy is means-tested and not unconditional. However, the fiscal stimulus policy is a near-universal policy that transfers cash directly to citizens.

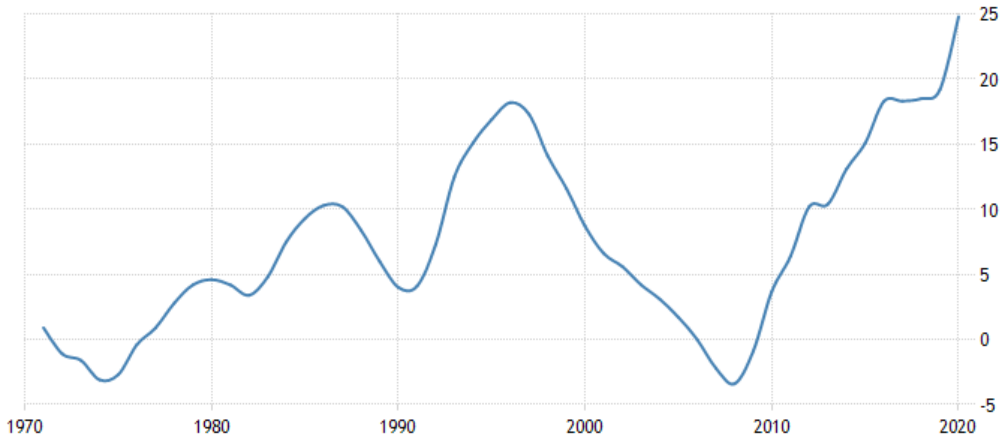
The fiscal stimulus in Australia was a policy and not an experiment. As such the fiscal stimulus policy did not have a control group to reliably check the effects of the policy. However, a model to test the effectiveness of the fiscal stimulus policy has been made. Li and Spencer (2015) argue based on the dynamic stochastic general equilibrium that due to the loss of productivity from the global economic downturn that three quarters of recession for Australia would have been a likely scenario without the fiscal stimulus. According to Li and Spencer (2015) the Australian economy would have entered a recession with the quarterly output growth declining from a positive 2.49 percent in September 2008 to -3.62 percent in December 2008. Li and Spencer (2015) argue a similar decline in March 2009 in output growth of -3.36 percent would have happened. After that, output growth would have likely significantly declined further to -6.49 percent in the quarter of June 2009 (Li and Spencer, 2015). Li and Spencer (2015) argue that the fiscal stimulus has avoided two quarters of negative output growth and reduced the volatility of output growth during the period the stimulus was distributed. However, Li and Spencer (2015) argue that after the initial quarters of fiscal stimulus the monetary policy of deflating the currency was more effective in keeping output growth up than the fiscal stimulus.

Several factors contributed toward the effectiveness of the fiscal stimulus. One factor that Leigh (2012) argues made the Australian 2008 fiscal stimulus more effective than the comparable US 2001 fiscal stimulus is the Australians their attitude towards the economy. Leigh (2012) notes although Australia in 2008 had a similar rise in unemployment compared to the US in 2001 (4 to 6 percent rise in unemployment). Leigh (2012) argues that Australia its economic prospects looked

more optimistic in comparison to the United States during the 2008 Great Recession. As the United States had a higher percent rise in unemployment during the Great Recession of 2008 than Australia. The positive attitude brought lower unemployment compared to the United States resulted in higher spending of the fiscal stimulus (Leigh, 2012). The framing surrounding the policy is argued to have increased stimulus spending. Leigh (2009) argues that the positive framing surrounding the Australian fiscal stimulus affected spending. Leigh (2009) notes that while the US 2001 fiscal stimulus was politically framed as a rebate to reduce the negative effect of the economic downturn. On the contrary, the Australian fiscal stimulus 2008 was framed as a gift. Households are more likely to spend bonuses like the 2008 Australian fiscal stimulus than the emergency benefits like the 2001 US fiscal stimulus (Leigh, 2009). However, while the fiscal stimulus might have boosted consumer spending the effects of the fiscal stimulus are argued to be short-lived. Li and Spencer (2015) argue based on interests and inflation rates that the distribution of the fiscal stimulus caused decreased interest rates in the quarters after the fiscal stimulus was distributed. The decrease in interest and inflation rates indicates (an Ricardian equivalence) that consumer spending was accelerated rather than increased (Li and Spencer, 2015).

Multiple variables affected how the Great Recession played out in Australia. The fact Australia had a budget surplus, a low level of net government debt and the Australian government created favorable trade terms by devaluation of the Australian Dollar contributed to Australia avoiding recession (Di Marco, Pirie & Au-Yeung, n.d.). Li and Spencer (2015) argue that the macro-economic effect of a large-scale direct cash fiscal stimulus is far-reaching. Furthermore, the short-term benefits may ultimately be undone by long-term budgetary contraction. Li and Spencer (2015) argue that the 2008 fiscal stimulus has largely contributed to the Australian Federal Government's rising public debt as seen in figure 7. Figure 7 shows the comparatively lower debt during the great recession and the rising public debt afterward. Armingeon (2012) notes that similar to Australia three other OECD countries (Canada, United States, New Zealand) also used counter-cyclical fiscal policies as economic measures. Compared to countries that used counter-cyclical fiscal policies the Australian deficit increased the least in a percentage comparison (Armingeon, 2012).

Figure 7: Australian Public Debt as percentage to GDP over 50 years



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The fiscal stimulus is thought to have had an effect on consumer spending. Spending after the direct cash fiscal stimulus was similar to the previous year. The Australian Senate Economic Committee (2009) compared the spending in May of 2008 and 2009 and found no statistical significant difference in the spending of May 2009 due to the spending being within the 95% confidence interval of the previous year. Considering that May of 2009 saw a worldwide economic downturn. As such, the stagnation in spending growth of May 2009 compared to May 2008 could be viewed as an effect of the fiscal stimulus (The Australian Senate Economic Committee, 2009). Aisbett, Brueckner and Steinhauser (2014) argue that most households spend their fiscal stimulus on durable goods. Aisbett et al. (2014) argue that consumption of non-durable goods (e.g. food) did not react significantly during or after the fiscal stimulus. However, the consumption of non-durable goods did have a statistically significant increase when the fiscal stimulus policy was announced. This premature spending of the fiscal stimulus shows the anticipation effect of a fiscal policy (Aisbett et al., 2014).

In addition to the Australian government its stimulus policies to create demand other factors also created demand. Day (2011) argues that demand in the Australian economy might have also been increased as a result of the Chinese government its stimulus policies. Glennen (2017) notes the Chinese government implemented the largest fiscal stimulus in Chinese history as a reaction to the 2008 financial crisis. The Chinese fiscal stimulus meant the demand for Australian minerals remained high which softened the Australia economic downturn (Glennen, 2017). Furthermore, the Australian economy has had a long period of GDP growth without economic setbacks prior to and post the Great Recession of 2008 (Glennen, 2017; Gonzalez, 2019). Glennen (2017) notes that Professor Borland of Economics at the University of Melbourne argues that three main reasons exist for the Australian government avoiding an economic downturn during the Great Recession. The first reason Professor Borland argues that prevented a recession is the fast government reaction of the economic stimulus adding liquidate to the economy that incentivizes spending rather than saving. The second reason Professor Borland argues is that high demand from the Chinese economy kept the Australian economy out of a recession. The third reason that Professor Borland argues is that the Australian bank had comparatively lower risked loans since the 1990s recession. The lower risk loans of the Australian banks may have mitigated defaulting on loans like the American banking sector (Glennen, 2017).

Summarizing, no definitive empirical evidence exists that the direct cash transfers for fiscal stimulus was the reason that the Australian economy was able to avoid an economic recession during the 2008 Great Recession. Evidence points towards the fiscal stimulus in addition to a multitude of factors being responsible for the avoidance of economic recession. Among those factors is spillover from the Chinese economy and spillover from the Chinese economic stimulus, Australian banks having lower-risk loans and defaulting less, and the Australian government having lower national debt which allowed for the budget of the stimulus packages. The direct cash fiscal stimulus helped as part of the stimulus packages due to the cash giving families access to liquid assets and incentivizing spending. Additionally, possible government messaging helped incentivize spending. Although no overall statically significant change in spending was measured surrounding the distribution of the fiscal stimulus. The stabilizing effect of the fiscal stimulus on spending was only short-lived. Recipients primarily spent their stimulus on durable goods. Finally, the low Australian government debt may have allowed fiscal stimulus. However, the Australian government debt has since risen. Although the increase in government debt is relatively lower compared to other OECD countries that used countercyclical fiscal stimulus policies.

United states – COVID-19-pandemic fiscal stimulus (2020-2021)

On March 27, 2020, the Coronavirus Aid Relief and Economic Security Act (CARES Act) was signed into law in response to the economic fallout of the COVID-19 pandemic in the United States (Taylor, Fram, Kellman & Superville, 2020). The CARES Act is the largest economic stimulus package in US history and constituted a 2.1 Trillion USD economic rescue package. The economic rescue package includes several elements like a 454 billion USD corporate loans policy, a 349 billion USD small business loans policy, a 301 billion USD households payments policy or a 250 billion USD unemployment insurance policy (Davidson & Mitchell, 2020; Wire, 2020) On December 27, 2020, the then lame-duck President Trump signed a new pandemic relief bill into law that saw another direct fiscal stimulus payment of 600 USD to eligible individuals (Luhby and Lobosco, 2020). To speed up the United States its economic recovery, the 1,9 trillion USD costing American Rescue Plan Act of 2021 was signed into law by President Biden on March 11, 2021. The American Rescue Plan Act would see another direct cash fiscal stimulus of 1,400 USD being paid to eligible individuals (Luhby and Lobosco, 2021).

This case study will focus on the payments to households with data primarily from the first stimulus packages of March 2020. Sauter (2020) tells the distribution of the first stimulus package began on April 10, 2020, via payments done by the Treasury department. The amount of the fiscal stimulus was based on income from the previous tax year. Sauter (2020) tells that single adults earning less than 75,000 USD a year would receive the full amount of fiscal stimulus of 1,200 USD and 500 USD per child. A household could earn up to 150,000 USD and receive the full amount of two fiscal stimulus checks of 2,400 USD for adults and 500 USD per child. The maximum income for eligibility for stimulus checks was 99,000 USD for individuals and 198.000 USD for households. Over 88% of Americans 18 years and older earn less than 75,000 USD annually and were eligible to receive the full amount of the stimulus check (Sauter, 2020).

The influx of money by the cash payments of the fiscal stimulus caused an effect on consumer spending. Gravelle (2020) argues a fiscal stimulus is as effective as the spending that the policy encourages. Jappeli and Pistaferri (2010) explain that fiscal stimulus via direct payments to low-income households is expected to have a 'multiplier' effect by boosting demand for products and services. However, Gravelle (2020) notes the multiplier effect of fiscal stimulus relies upon a household its Marginal Prosperity to Consume (MPC hereafter). MPC is defined as the fraction of an extra dollar of aid that a household spends on consumption (Gravelle, 2020). Several differing margins about the MPC margin of the CARES Act fiscal stimulus are argued. Coibion, Gorodnichenko and Weber (2020) argue stimulus recipients generally reported on planning to spend 40% of the received stimulus. Furthermore, 15% of recipients reported on planning to completely spend the received fiscal stimulus cash. However, most recipients reported having plans to save the stimulus or transfer the money for paying bills (Coibion, 2020). Baker et al. (2020) argue based on the data from a personal financial app that the estimated MCP margin of the CARES Act fiscal stimulus is 0.25 to 0.35. While Karger and Rajan (2021) argue based on data from Facteus that the MCP for the fiscal stimulus of the CARES Act is 0.5. Misra, Singh and Zhang (2020) argue that half (0.51) (0.29 excluding banking) of the stimulus is spent within a few days receiving the fiscal stimulus. The 0.22 of the stimulus used for banking transactions could indicate rent payments or debt payments (Misra et al, 2020). Karger and Rajan (2021) argue lower margins of MCP with a margin of 0.44 after two weeks following the fiscal stimulus distribution. Furthermore, repeating the data for the December fiscal stimulus shows a lower MCP margin of 0.39 after two weeks following distribution of the December fiscal stimulus (Karger and Rajan, 2021). As a final note, the effect of the fiscal stimulus may be softened due to the restrictions of the pandemic limiting some forms of consumerism (Carroll et al., 2020).

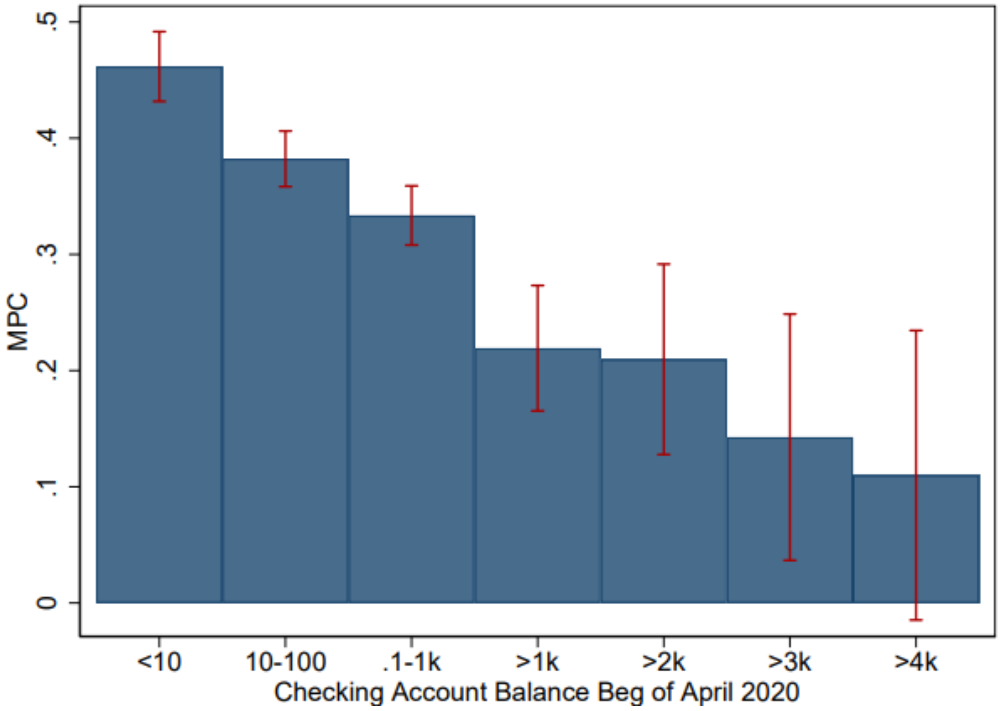
Notably, as a policy response to the effects of the pandemic, a renting moratorium was introduced that prevented evictions as part of the CARES Act in March 2020 (Orvin, 2020). This eviction moratorium lasted in some capacity until August 26, 2021, when the United States Supreme Court blocked enforcement (McCarty, Carpenter & Perl, 2021). It is unknown if the eviction moratorium had any effect on payments of fiscal stimulus recipients such as rent payments.

The overall impact of the fiscal stimulus of the CARES Act on consumer spending may have been limited. Misra et al. (2020) argue the additional spending from the fiscal stimulus only represents a 3% increase in aggregate consumer spending over the period April 10 to April 17 (the stimulus was distributed partially over this period based on ZIP-codes).

The individual relief from the fiscal stimulus has certain trends in spending and thus effectiveness. Misra et al. (2020) argue three trends in spending habits exist for the fiscal stimulus. First, Misra et al. (2020) argue most spending of the fiscal stimulus was done on groceries and utensils. Spending trends differed based on geography. Metropolitan areas with a high cost of living have up to three times higher MPC than other areas. Second, Misra et al. (2020) argue areas with lower workplace mobility had up to a 70% higher MPC. Third, Misra et al. (2020) argue that spending of the stimulus was decreased in areas with stay-at-home orders compared to no stay-at-home orders. Areas with no stay-at-home orders saw an increase in activity 200% higher compared to normal activities. While areas with stay-at-home orders saw an increase in activity by 60% compared to normal activities (Misra et al., 2020). However, Baker et al. (2020) argue differences regarding income level and liquidity (how easy one can access cash) affected the spending surrounding the fiscal stimulus. Baker et al. (2020) argue that lower bank account balance increases stimulus spending as shown in figure 8. Figure 8 shows a higher level of stimulus spending for people with lower amounts of savings in their bank accounts. Indicating that the stimulus was particularly impactful for less wealthy households and individuals. Furthermore, Baker et al. (2020) argue that job security affected the MPC. Households with declining income saw higher rates of MPC (0.4) compared to households with no income decline (MPC 0.33). Baker et al. (2020) speculate that the effect of job loss on stimulus MPC is lessened due to unemployment insurance of the CARES Act.

The fiscal stimulus had no effect on labor supply. Coibion et al. (2020) argue that the direct cash fiscal stimulus did not have any effect on labor supply. Contrary to this, unemployed recipients of the stimulus reported increased motivation to search for employment (Coibion et al., 2020).

Figure 8: Average MPC of fiscal stimulus correlated with liquidity in bank accounts



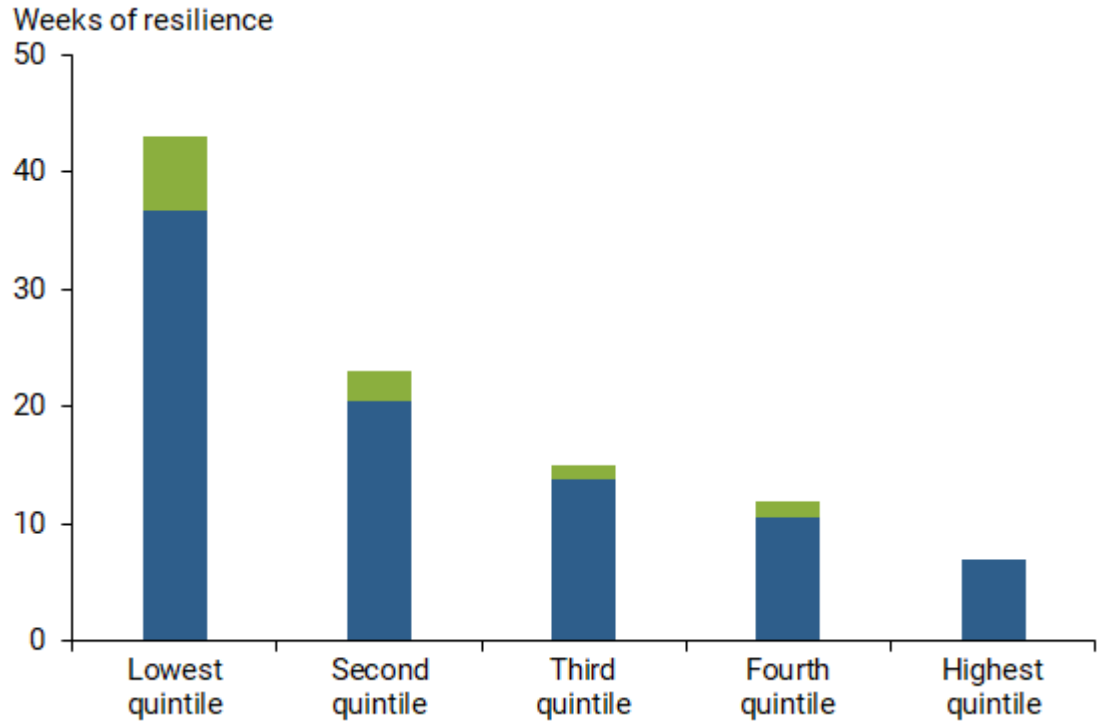
Retrieved from Baker et al. (2020)
** red lines represent 95% confidence interval*

Not all people had access to stimulus checks. Marr, Cox, Bryant, Dean, Caines and Sherman (2020) argue that 12 million people were in danger of missing out on their stimulus checks. Marr et al. (2020) argue several reasons for the ''universal'' stimulus check not reaching all people other than the previously mentioned income cap. First, Marr et al. (2020) note that due to distribution being based on filed income taxes many low income households could not receive the fiscal stimulus. The taxation authority missed filed tax income data of low income households due to low income households not having the obligation to file taxes (12,400 USD for individuals and 24,800 USD for married couples). Second, Marr et al. (2020) note the CARES Act excludes undocumented immigrant groups due to the need for a social security number. Furthermore, Marr et al. (2020) notes that roughly 75% of the people missing out on the fiscal stimulus are on social programs like food stamps (SNAP) or Medicaid. Additionally the people missing out on the fiscal stimulus are disproportionately people of color (Black and Latino) (Marr et al., 2020).

The different policies used to lessen the economic impact of the COVID-19 pandemic had varying degrees of effectiveness. Aylward, Laderman, Oliveira and Teng (2021) note that the CARES Act allowed households to maintain their current level of spending which raised a household its resilience. Aylward et al. (2021) argue that for median income households, the CARES Act increased the resilience by 15 weeks, among minority groups (Hispanic and Black) the median households resilience was raised by 19 weeks. For lower-income households the resilience was raised by 45 weeks. However, Aylward et al. (2021) argues the increases in household resilience are chiefly due to unemployment insurance and not the fiscal stimulus. Aylward et al. (2021) note the unemployment insurance tacked on 600 USD a week compared to the one-time fiscal stimulus ('one time' 1,200 USD maximum per adult). The impact of unemployment insurance on household resilience was significant. As unemployment insurance contributed 85% of resilience for the median lowest income quintile of households (Aylward et al., 2021). Aylward et al. (2021) argues the effect of unemployment insurance was statistically significant for household resilience during the pandemic and economic downturn. However, the effect of direct cash transfers on household resilience was insignificant. The effect of both unemployment insurance and the fiscal stimulus on household

resilience are represented in figure 3. However, Aylward et al. (2021) note that the comparison is skewed. This skewness is due to the fact that fiscal stimulus was only available to people below an income threshold of 75,000 USD (Aylward et al., 2021). However, Aylward et al. (2021) argue that a more universal approach of the fiscal stimulus would have made the effect of the fiscal stimulus on household retention lower.

Figure 3: Effect of stimulus compared with unemployment insurance for household resilience



Blue part of the bars represents the effect of unemployment insurance on financial resilience while the green part of the bars represents the effect of fiscal stimulus on financial resilience.

Retrieved from Aylward et al. (2021)

The economic impact of a fiscal stimulus policy can be evaluated by the greater the fraction of the stimulus that was spent as opposed to saved. Baker et al. (2020) note that the spending fraction for direct fiscal stimulus is greatly dependent on the household income. The fiscal stimulus of the CARES Act sees a higher fraction of spending for lower-income households (Baker et al., 2020). However, Gravelle (2020) argues that compared to other policies, direct fiscal stimulus sees lower fractions of spending than the Paycheck Protection Program and some forms of business loans. Although, loans to businesses see a lower fraction of spending compared to direct fiscal stimulus. Furthermore, all stimulus that creates greater demand is likely less effective due to the nature of limited supply which was amplified by production limitation during the COVID-19 pandemic (Gravelle, 2020). Additionally, Gravelle (2020) argues that the long-term impact of an annual or monthly direct cash transfer is expected to offer less economic stimulus than a one-time direct cash transfer.

To summarize, the direct fiscal stimulus was largely spent within a few days or weeks of recipients receiving the cash from the stimulus. The estimation of the consumption response to the stimulus check differs between margins of 0.25 to 0.5 of consumption of the stimulus. The consumption rate is largely dependent on preexisting liquefiable assets. With wealthier recipients

spending a lower margin of their stimulus check. Additionally, stay-at-home orders and lower job security reduced consumption. While living in a metropolitan area or working in a workplace with lower workplace mobility raised the consumption of the direct-cash fiscal stimulus. Spending was done mainly on non-durable consumption, utensils, and paying bills (banking transfers). Issues with the implementation of the stimulus policy caused difficulty for an estimated 12 million people. The implementation difficulties disproportionately affected poorer people and people of color. The effectiveness of the direct cash fiscal stimulus for social security is not higher than unemployment insurance policies. Furthermore, the efficiency of direct-cash fiscal stimulus for economic stimulus is lower than paycheck protection loans or direct transfers to business but has a higher efficiency compared to business loans.

Kuwait - Amiri grant (2011)

On January 16, 2011, the Amir of Kuwait announced a grant of 1000 Kuwaiti Dinar (KWD) (equal to 3,580 USD) for every Kuwaiti citizen born before February 1st, 2011 (Kuwait News Agency [KUNA], 2011). Van der Borght (2011) tells the grant was approved by the national assembly on January 26, 2011. The Kuwait government approved the cash grant together with free essential food items to each of Kuwait's 1,155 million citizens. Officially the justification for the grant was to celebrate the 50th anniversary of Kuwait its independence and the 20th anniversary of Kuwait its liberation of Iraqi occupation during the first gulf war (Van der Borght, 2011). Van der Borght (2011) notes the cash payment was made on February 24, 2011, and the food distribution began on February 1, 2011, and would last until March 31, 2012. While the Amiri grant policy appears universal, more than two-thirds of Kuwait residents (2,4 million) were not eligible for the policy (Gentilini et al., 2021).

Ulterior motivation for the policy adoption could be the protests of the then ongoing Arab Spring which had not reached Kuwait (yet). The announcement of the grant by the Amir came two days after nearly a month of protests had ousted the 23 years sitting Tunisian president (British Broadcasting Corporation [BBC], 2011a). Moreover, the parliamentary approval came one day after large-scale protests in Egypt began on the 25th of January (BBC, 2011b). The protests of the Arab Spring would also reach Kuwait. The Wall Street Journal (WSJ, 2011) notes the first observed protest linked to the Arab Spring in Kuwait was a protest by the ''stateless'' (non-citizens residents) on February 19. Kuwait would see more protests and political instabilities of the Arab spring over the following two years (Eaves, 2013). Although it is not certain that the Arab Spring played a role in the creation of the Amiri Grant, the timing is notable. An example of this argument comes from The Economist as seen in Santes (2014) who writes: *''If you [as a political leader] don't own your citizens' loyalty, perhaps you can rent it for a while.''*. The Economist (2011) also draws a trend between Arab governments using generous policies (e.g. Egyptian bread subsidies) and the ongoing Arab spring. The Economist (2011) argues the generous government policies are meant for appeasing their citizens during the political turmoil of the Arab Spring.

While the Amiri grant policy did grant money towards citizens. However, the policy differs from a UBI in that the grant was a singular one-time payment. Furthermore, the Amiri grant policy was combined with an in-kind food policy and the Amiri grant policy was only eligible for citizens and not for residents.

The Amiri grant policy did not have unintended economic effects. For the year 2011 Oxford Business group (2011) reports that inflation dropped to an 11-month low of 4.6% in July. While the decrease in inflation was worrying at the time. However, later data showed inflation to be around 5% for the year 2011 (Marcopolis, 2012). Later statistics show a decrease in inflation in the second half of 2011 as shown in figure 9. Figure 9 represents calendar years on the horizontal axis and the percentage of inflation on the vertical axis. Ultimately, the Amiri grant seemed to have no profound effect on inflation due to the growth in inflation happening before the policy was announced or implemented.

Figure 9: Kuwaiti inflation from 2010 to 2012

Retrieved from TradingEconomics (n.d.d)

The Amiri grant was not completely consumed after payout. Marcopolis (2012) notes the year 2011 saw around a 7 to 8% growth of asset deposits in the Kuwaiti banking sector. The growth in asset deposits could indicate that the Amiri grant was not completely consumed or spending stagnated due to political instability (Macropolis, 2012).

Part of the Amiri grant policy included a free essential food policy for all citizens during a 14 month period. Oxford Business Group (2011) notes that during the 14 month period the Amiri grant was distributed that food prices inflated. While inflation for food prices is reported at an all-time high of 9.7%. However, Oxford Business Group (2011) argues that the inflation is not linked to the in-kind food policy of the Amiri grant. Since global supply shortages which affected food prices also affected other sectors like housing during this period (Oxford Business Group, 2011).

The Amiri grant was an expensive policy. Marcopolis (2012) notes that the Amiri grant is a loss of public deficit that hinders future economic spending like e.g. diversifying the economy. Kholaif (2011) notes that the Amiri grant policy cost 1.12 billion KWD (4 billion in USD) for the direct cash payments alone. In addition, the free essential food program cost 230 million KWD (818 million USD) (Kholaif, 2011). However, during this period Kuwaiti public debt to GDP was at one of its lowest points. Data from Trading Economics (n.d.c) shows that Kuwaiti public debt was 4.6% of GDP at the beginning of 2011. This debt would drop to 3.6% at the end of 2011 and would continue lowering to the lowest point in 20 years of 3.1% of GDP at the start of 2013 (Trading Economics, n.d.c). Needless to say, even though the Amiri grant does not seem to have long-term benefits like other public spending. The government budgeting allowed room for such a policy.

In conclusion, the lack of a control group makes it difficult to pin effects with certainty to the semi-universal cash grant policy. However, the absence of economic effects (like inflation) does give insights into the effects of (semi-)universal cash grant policies. The Amiri grant policy shows signs of limited consumption of the cash grant policy. The Amiri grant might also show the potential of direct-cash policy applications for political reasons. The use of direct cash transfer for political reasons would be similar to the use of direct cash policies in Hong Kong and Macau.

Italy – Citizens' Income (2019)

The *''reddito di cittadinanza''*, or the Citizens' Income is a welfare policy that was approved on January 19, 2019, and went into law in March 2019. Giannetti, Pinto and Plescia (2020) note the unconditional basic income was the key pledge from the Five Star Movement party in the Italian national elections in 2018. During the election the Five Star Movement party received 32.68% of the vote, up from 25.56% in 2013. The Five Star Movement party ended up forming the first post-war populist coalition government (Giannetti et al., 2020). gliano (2019b) tells the policy proposal has proven particularly popular with young voters (ages 25-34), particularly in areas where unemployment rates were high.

The Citizens' Income policy differs from a UBI policy. Giugliano (2019b) notes that the citizen's income is a replacement for social unemployment policies and is household-based instead of individual-based. Additionally, the resident must have lived in Italy for 10-years to be eligible for the Citizens' Income (Giugliano, 2019b). Furthermore, L&E Global (2019) notes working-age people must enroll in job training and accept a job within three offers or lose the income. Companies are incentivized to hire a Citizens' Income recipient as the company gets to reduce its social security contributions (L&E Global, 2019). Giuffrida (2019) explains the Italian citizen's income is eligible for households earning less than 9,360 euros (10,612 USD). The Citizens' Income can add up to 780 euros (884 USD) per month for single people and up to 1,300 euros (1,474 USD) per month for households with two children. The Citizens' Income is estimated to cost 7,1 billion euros in its first year of 2019 (Giuffrida, 2019). For the year 2020, 1,168,364 people received a Citizens' Income policy (Varrella, 2021).

The Citizens' Income policy is not unanimously considered a UBI policy. Gobetti (2018) tells Italian UBI advocates criticize the Citizens' Income policy for not being a Universal Basic Income. Italian UBI advocates compare the Italian Citizens' Income to existing income support policies such as the German Hartz IV policy or the Universal Credit policy in the United Kingdom rather than a UBI policy (Gobetti, 2018).

The policy of Citizens' Income was proposed by the Five Star Movement party to combat worsening poverty and inequality rates in Italy. Poverty rates in Italy have worsened since the 2008 Great Recession (Giugliano, 2019a). Giugliano (2019b) tells that poverty rates in Italy have increased from 2008 till 2019. Where in 2008. 18.9% of Italian people were at risk of poverty and 7.5% of Italian people live with serious deprivation. In 2019 the financial struggles have increased to 1-in-5 of Italian people who are at risk of poverty and 1-in-10 of Italian people who live with serious deprivation (Giugliano, 2019b). Furthermore, Giugliano (2019b) argues the citizen's income policy may target the wrong people. The vulnerable group of people in Italy are foreigners and households with lots of children. However, due to the 10-year residency requirement foreigners are not eligible for the Citizens' Income (Giugliano, 2019b). Giugliano (2019a) argues the citizens' Income policy may exclude people without Italian citizenship. Households with one foreign-born member are twice as likely to be at risk of poverty or social exclusion. The risk of poverty In Italy for people without Italian citizenship has been rising from 33.9% in 2006 to 55% in 2016 (Giugliano, 2019a).

The policy of citizen's Income was proposed by the Five Star Movement party to combat worsening poverty and inequality rates in Italy, partly as a result of the 2008 great recession and following economic crises (Giugliano, 2019a). (Giugliano, 2019b) tells as poverty rates have increased from 2008 to 2019, where the first 18.9% was at risk of poverty and 7.5% of people live with serious deprivation, in 2019 1-in-5 people are at risk of poverty and 1-in-10 people live with serious deprivation (Giugliano, 2019b).

The Citizens' Income policy may target the wrong people for poverty alleviation. Giugliano

(2019b) notes that the vulnerable group of people in Italy are foreigners and households with lots of children. Due to the 10-year residency requirement (Giugliano, 2019b). Giugliano (2019a) argues the citizens' Income policy may exclude people without Italian citizenship. Households with one foreign-born member are twice as likely to be at risk of poverty or social exclusion. The risk of poverty for people without Italian citizenship has been rising from 33.9% in 2006 to 55% in 2016 (Giugliano, 2019a). Giugliano (2019b) argues that while the support for a household of one child is generous. However, a household with five children gets a similar amount of Citizens' Income as a household with three children. Moreover, households with more members are at greater risk of poverty than smaller households (Giugliano, 2019b). Giugliano (2019a) also argues the Citizens' Income policy may be ineffective at helping the people at risk of poverty the policy aims to help. As the Citizens' Income policy is difficult for young people to access due to people under the age of 26 being considered dependable. Meaning people under the age of 26 are not eligible to receive Citizens' Income while living alone. Giugliano (2019a) notes that three months after the program was implemented in the middle of March 2019 only 6.7% of the claimants were under the age of 30.

The Citizens' Income policy is predicted to have troubles in creating employment. Michel Martone, a current labor law professor at Luiss University Rome and former Italian deputy minister for labor in Giugliano (2019) describes the fight against poverty as: *I think [the Citizens' income] will be useful in fighting poverty, but the second objective of finding people jobs will be difficult. This is because they haven't implemented the administrative structure necessary to find people jobs. Another problem, especially in the south, is that there are no jobs, so it's going to be really hard for people to get work* (para. 1). Additionally, Giuffrida, (2019) notes the southern part of Italy has a more informal labor market which makes it harder to track employment status. Giugliano (2019a) argues for risk of fraud due to the incentive of the 780 euro benefit that is higher than 43% of the wages paid in southern Italy. Workers might ask to be paid under the table or be paid lower wages to be eligible for Citizens' Income (Giugliano, 2019a).

The government's budget for the Citizens' Income policy is not stable. During the year of 2019 the Italian budget ran a deficit of 2.4% (Giuffrida, 2018). Giuffrida (2018) notes the Italian government has no current long-term budget for the Citizens' Income policy. Giuffrida (2018) notes that the Italian government plans to close the budgetary gap was by increasing value-added tax (VAT hereafter) which is estimated to increase the budget by 20 billion euro. However, VAT is a regressive tax that weighs most heavily on the purchasing power of poorest citizens (Giuffrida, 2018).

To summarize, although it is too soon to evaluate the effects of the Citizens' Income policy, several things can be taken away from this case study. The citizen's income policy imposes several conditions which resemble an income support policy rather than an unconditional Universal Basic Income. Furthermore, the conditional eligibility is reasoned to make the policy less effective in alleviating poverty. Additionally, the risk of fraud surrounding conditional eligibility persists due to incentives for higher income. The effectiveness of the Citizens' Income policy to create employment is currently doubtful and awaits to be seen.

United States - Eastern Band of the Cherokee Nation (1996-present)

The Eastern Band of the Cherokee (2012) tells its history as a federally recognized tribe that is based in the western part of the state of North Carolina. The Indian Removal Act relocated large parts of the tribe to west of the Mississippi River in the late 1830's. Cherokee tribe members remaining in the East now form the eastern band (Eastern Band of the Cherokee, 2012). Utter (2001) writes that in 1870 the tribe purchased the land the tribe lives on which later became a federal trust. In 1924 the Baker roll act of Congress created a commission to formalize the membership of the Eastern Band of the Cherokee Indians (National Archives, n.d.). Utter (2001) notes the Indian Gaming Regulatory Act (IGRA) of 1988 was signed with the purpose of protecting Indian gaming and the revenue streams that games of chance bring to native-American tribes. Additionally, legalizing games of chance allows for the suppression of often associated crime (Utter, 2001). Since 1997, the Eastern Band of the Cherokee tribe has paid Casino dividends to all Baker Roll Act tribe members (Samuel, 2020). In recent years revenue from gambling has decreased which is believed to be caused by the rise of online gambling (McFarland, 2016).

The impact of the casino diffident was observed in the Great Smoky Mountains Study that started in 1993. Marinescu (2018) notes the study design of the Great Smoky Mountains study was a 11-year longitude study that followed a total of 1420 children and adolescents in North Carolina to gauge mental and emotional health. The cohorts were made up of white children and adolescents (n=1,070) and Native American children and adolescents (n=350). The cohort study followed the children annually until age 16 and then again at ages 19, 21, 24, and 25 (Marinescu, 2018). However, Costello et al. (2010) notes after the fourth round of the cohort study the Eastern Band of the Cherokee Indians opened a casino on their lands in 1996. The casino distributes an equal portion of its revenue every half year on a per capita basis to every adult tribe member of the Eastern Band of the Cherokee. The casino distribution provides an unconditional annual income to every adult tribe member of around 4,000 USD. since 1996, which has risen to around 9,000 USD by the year 2006 (Costello et al., 2010).

The tribe members receiving dividends continued to work the same amount of hours. Akee, Copeland, Keeler, Angold and Costello (2010) argue based on comparing data of tribe member households from before and after the dividend payment compared to white households shows no effect on labor supply of tribe member households. Marinescu (2018) reasons the labor supply effect may be offset by the fact that the casino opening also created job opportunities for Members of the Eastern Band of the Cherokee. However, Marinescu (2018) argues the median distance from a tribe member its house to the casino is 36 miles (around 58 km). This distance would make commuting long and limits job opportunities in the Casino of tribe members (Marinescu, 2018). Wolfe, Jakubowski, Haveman and Courey (2012) find evidence that casinos on native American lands increase the average income by 5%. Furthermore, Wolfe et al. (2012) argue casinos and their associated dividend payments generally do not decrease labor supply.

Educational outcomes improved for children from households that received dividend payments. Akee et al. (2010) argue that children from households that received dividend payments had higher school attendance and completed more years of education. Particularly children from poorer families and children who were younger when the policy started benefited the most. Akee et al. (2010) argue an additional 4,000 USD annually for the poorest households increased educational attainment by one year at age 21. Additionally, Akee et al. (2010) note the payout of casino dividends reduced crime among children. Native American children saw a larger drop in self-reported crimes after the casino payment started compared to white children. The self-reported data is backed up by policing data. Administrative crime records show a significant 22% drop in crime for the age-groups of 16 and 17-year-olds. However, Akee et al. (2010) note both the increase in educational attainment

and reduction in crime are driven by effects on the poorest households. Akee et al. (2010) reason that these changes are results of improved quality in parental interactions with children. Data shows no changes in working times and thus the number of parental interactions likely remained similar to before the dividend payments.

Alcohol, tobacco and drugs-related addiction occurred less among youth from households that received dividend payments. Costello et al. (2010) argue that tribe members had significant lower rates of alcohol and cannabis abuse. However, Costello et al. (2010) note the casino dividend shows no effect on usage of other drugs. Wolfe et al. (2012) argue the increase in income from dividend payments reduces obesity, smoking, and anxiety among youth. Akee et al. (2010) argue that the casino dividend payments caused significant reductions in drug-dealing activities among youth. The studies of Costello et al. (2010) and Wolfe et al. (2012) argue contradictory results in that Costello et al. (2010) find no evidence that casino dividend payments reduce smoking while Wolfe et al. (2012) does find evidence for a reduction in smoking

The casino dividend payments improved the mental and physical health of children as adults. Costello et al. (2010) argue the youngest native American cohort had significantly lower rates of psychiatric disorders as adults (31.4%) compared to the middle cohort (41.7%) or compared to the older cohort (41.3%). Additionally, Costello et al., (2010) argue that the youngest native American cohort had a significantly lower rate of psychiatric disorders compared to their peers in the youngest white American cohort (37.1%) However, the dividend payment showed no effect on adult psychopathology. Only children of whom the parents were exposed to cassino dividend payments saw a significant change when the children were adults.

To summarize, the casino dividend payments had several effects on tribe members of the Eastern Branch of the Cherokee Nation. The payments significantly improved the years of education children obtained. Statistically, by the time a tribe member is 21-years-old the tribe member would have obtained one more year of education due to the dividend payment. Statistically, by the time a tribe member is 21-years-old the tribe member would have obtained one more year of education due to the dividend payment. Crimes were significantly reduced by 22% for the youngest cohort. Example being that the dividend payment correlated with reduced drug-dealing among youth. Adults of whom the household had received dividend payments when young had a reduced risk of psychiatric disorders. Tribe members had significant lower rates of alcohol, tobacco and cannabis addiction and abuse. The casino dividend payments had no effect on the labor supply of tribe members.

United States - Alaska Permanent Fund (1982-present)

The Alaska Permanent Fund pays dividends by giving all Alaskans a share of the oil revenue of the state-owned oil company. The Alaska Permanent Fund and its associated dividend distribution program are a unique experiment in the intergenerational transfer of wealth and the redistribution of public funds back to the private individuals (O'Brien & Olson, 1990).

The Alaska Permanent Fund exemplifies questions about how the public sector can best manage public wealth. O'Brien and Olson (1990) tell the concept of the Alaska Permanent Fund was conceived in 1976. The Alaskan economy had known economic booms and busts prior to 1976. For this reason Alaska residents felt that some proportion of the oil revenue share should be saved for future years. O'Brien and Olson (1990) note that originally the Permanent Fund was designed to preserve the oil revenue for future generations. Instability in budgeting of the Permanent Fund existed due to 25% or more of Alaska its state budget coming from the oil and mineral industries. Originally, the Permanent Fund was conceived to make income-producing investments. However, the income-producing conception was not codified into law. O'Brien & Olson, (1990) note the lack of codification in law meant there was no restriction on how the money could be spent. Saving in the Permanent Fund began in 1977. In 1979 Governor Hammond proposed to distribute some of the income interest received in the Permanent Fund. The suggestion to distribute income got considerable public support (O'Brien & Olson, 1990).

Once dividend payments were adopted the lowering of these dividend payments from the Permanent Fund was unpopular. An example from Coelho (2019) is the 8,3 billion USD Alaska state budget for 2020 which saw a 410 million USD budget cut. 130 million USD of the 410 million USD budget cut would fall upon Alaska its university. The 130 million USD budget cut would reduce the university its budget by 41% (Coelho, 2019). Mudde (2019) argues that the State of Alaska may never recover from the budget cut to the university. Mudde (2019) notes the economic multiplier effect of universities from the working paper from Vakeri and Van Reenen (2016). Vakeri and Van Reenen (2016) argue that unlike the dividend payments universities boost GDP. Shepherd (2019) notes that Governor Dunleavy had made political promises to increase the Permanent Fund its dividend payments each year. However, the estimated economic impact of Alaska its university is 714 million USD directly and 402 million USD indirectly to Alaska its economy (Shepherd, 2019).

The people of Alaska their perspective of the Permanent Fund policy is predominantly positive. Goldsmith (2011) notes that the Permanent Fund Dividend policy only contributes 3% on the average annual per capita income . However, Goldsmith (2011) argues the dividend payment policy has become extremely popular with the Alaskan population. Goldsmith (2011) reasons that most Alaskans feel that individuals can benefit more from spending the money themselves rather than government spending the Permanent Fund interest. Goldsmith (2011) notes only a minority of the population critiques the Permanent Fund. One argument Goldsmith (2011) notes that is used to critique the fund is that the dividend fosters a more consumerist mentality among the population. The popularity of the dividend gives the Permanent Fund strong support for continuation. Although Goldsmith (2011) notes concern exists among the Alaskan population that the dividend payments will prevent the Permanent Fund from being used for the ultimate purpose that the Permanent Fund was conceived for. The purpose for the conception of the Permanent Fund was to help support the Alaskan economy after petroleum production ends.

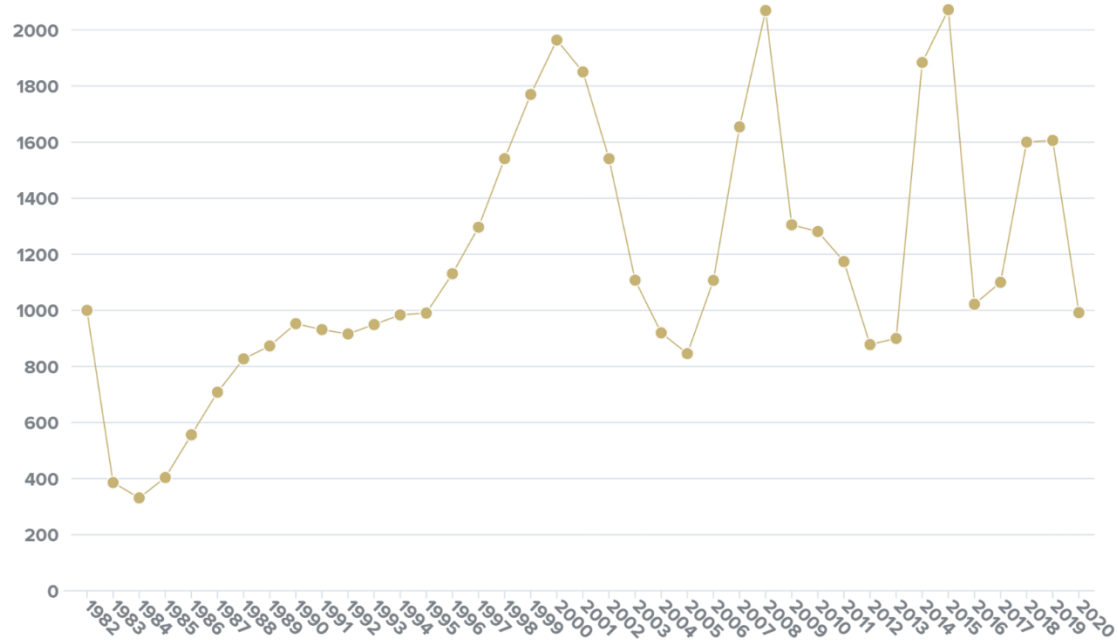
Eligibility for the dividend of the Permanent fund is universal. However the State of Alaska (2021) has some criteria for eligibility. Eligible recipients have to be a resident of Alaska, while having no residency in any other state for the entire previous year, and resident must have the intent to remain a resident of Alaska indefinitely. Eligibility is lost when the resident was sentenced for a

felony or incarcerated for a felony or two misdemeanors, or if the resident was convicted of a felony the previous year (State of Alaska, 2021).

Jacobson (2021) argues that Alaska Permanent Fund Dividend is the closest policy that has been used that meets the definition of a UBI policy. In that, the dividend of the Permanent Fund is paid annually, to each individual, regardless of age (paid-out to children older than 1 year), without means test or other conditions. Griffin (2012) notes discussion surrounding eligibility still exists. Questions such as what should constitute minimal residency and if felons should be eligible to receive a dividend payment surround the eligibility of the Permanent Fund (Griffin, 2012). Nevertheless, the Alaska Permanent Fund Dividend is unique in that it is the only basic income policy that has been implemented for a long time. As such, the Permanent Fund allows the study of long-term effects of Universal Basic Income policies.

The payout is an unstable element since the nominal level of the dividend payment differs depending on the 5-year annual profits of the Permanent Fund. An overview of dividend payments from 1982 to 2020 can be seen in figure 10. As a side note, the listed amounts are nominal and not adjusted for inflation. Berman (2018) gives the comparison that the dividend payment for a family of four in 1982 would average around 6,600 USD in 2015.

Figure 10: Nominal annual dividend payment Alaska Permanent Fund since 1982



Based on data retrieved from the State of Alaska (n.d.) made by Wikipedia contributors (2020)

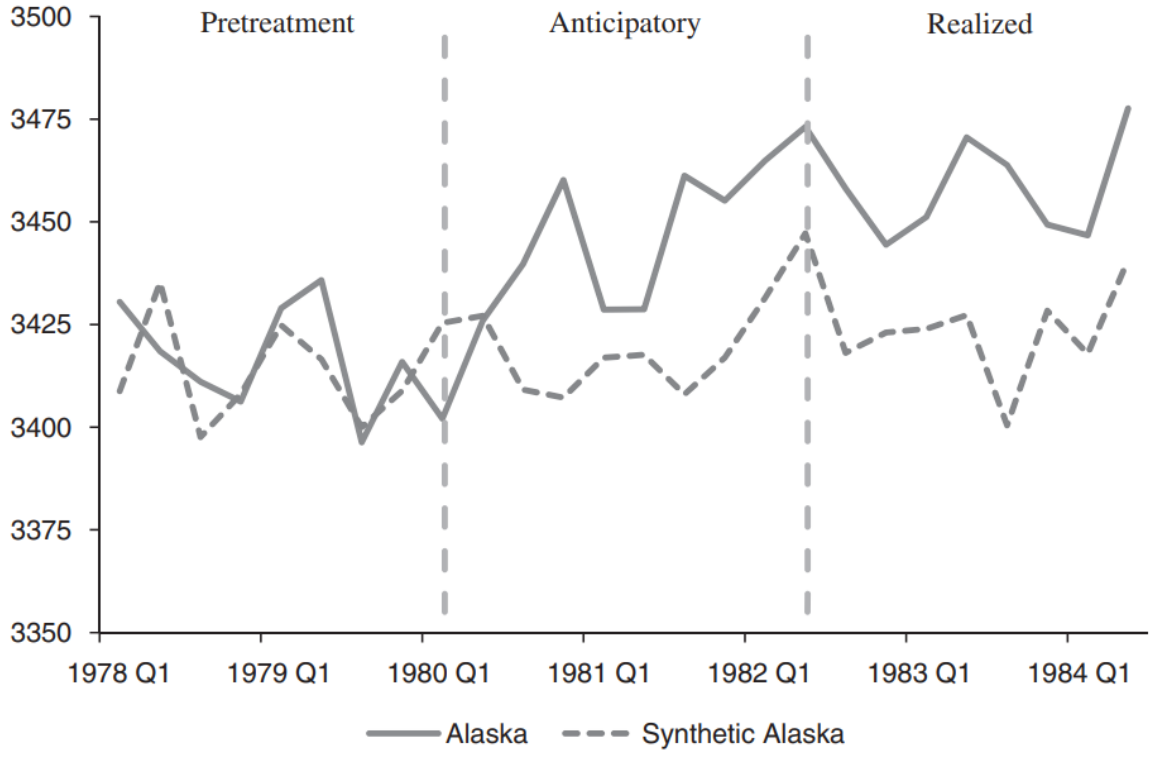
Households tend to smooth out their Permanent Fund dividend payment. Kueng (2018) offers more insight into spending. Kueng (2018) argues that on average households spend 11 cents of every dividend dollar in October (the month when the dividend is paid-out). After that, households drop their spending to 5 cents per dollar in November and 7 cents per dollar in December. After three months around 0.22 to 0.24 of the dividend is spent (Kueng, 2018). Kueng (2018) notes a large disparity in spending behavior exists between the richest quintile of households and the poorest quintile of households. While the richest quintile of households spends 0.7 in the first quartile after receiving the dividend. However, this spending is in contrast to the poorest quintile of households who only spend 0.1 in the first quartile after receiving the dividend. Kueng (2018) reasons two different explanations for this, first is due to the richest households having enough assets they can

liquidate and do not have the need to save the dividend payment. As such, richer households feel no guilt for spending it. Second, Kueng (2018) argues that almost all recipients receive these payments around the same time. As such the social norm has evolved that richer households can afford to spend more lavishly on these occasions.

Dividend payments do not only affect changes in consumption but also affect other behavior. Watson, Guettabi and Reimer (2019b) argue that between 2000 and 2016, in the weeks after the dividend was paid out the policing for poverty-related crimes decreased by 8%. However, policing for substance abuse crimes rose by 10% in the same period (Watson et al., 2019b). Furthermore, Watson et al. (2019a) note the medical assistance required related to substance abuse increases in correlation with the size of the dividend payments. However, poverty-related crimes show no relation with changes in the amount of the dividend payment. Watson et al. (2019a) argue that spreading the payment out over the year would decrease substance abuse while still lowering poverty-related crime.

The extra income of the Permanent Fund Dividend leads recipients to make healthier spending choices. For instance, Chung, Ha and Kim (2015) argue that children born in Alaska under the Permanent Fund Dividend policy are on average more healthy compared to children in other states. Alaskan children had an average increase in birth weight of 34.8 grams compared to children in other states. Chung et al. (2015) argue that on average the increase of 1,000 USD in the dividend payout increases the birth weight of a newborn by 17.7 grams. This effect can be seen in figure 11. Figure 11 compares average birth rates by using a Synthetic control approach with weighted data of U.S. states with the most similar monthly birth weight pattern. Furthermore, Chung et al. (2015) note the Alaska Permanent Fund leads to a substantial decrease in cases of low birth rates. Additionally, the study found a small increase in 5-min-APGAR-scores which measures the health characteristics of newborns.

Figure 11: Effects of the Alaska Permanent Fund Dividend on Birth Weight



Retrieved from Chung, Ha and Kim (2015)

**State weights in the synthetic Alaska are South Dakota (46.9%), Maine (44.9%), and Nevada (8.2%)*

The trend in positive health continues into childhood. Watson et al. (2019a) argue based on fluctuations in the amount of annual dividend paid out and the cut-off date by age were cross-referenced with 3-year-old toddlers their Body Mass Index (BMI). Based on this Watson et al. (2019a) argue that an additional 1,000 USD increase in dividend reduced the chance of childhood obesity by 4.5%. Watson et al. (2019a) note the positive health results are driven by toddlers of households that earn between 25,000 USD and 75,000 USD annually. Watson et al. (2019a) did not find effects on health for lower or higher-income households. Based on these results, Watson et al. (2019a) argue a hypothetical 1,000 USD increase in dividend could reduce the 22.4% of obesity in toddlers.

Dividend payments affect labor supply. Jones and Marinescu (2019) argue that the economic effect of the dividend payments of Alaska its Permanent Fund are comparable with a cash stimulus to the local economy. While the general equilibrium theory of supply and demand would assume that an increase in income would decrease the demand for work. However, Jones and Marinescu (2019) argue the dividend payments had had no effect on overall employment rates compared to other states in the US. Jones and Marinescu (2019) argue that a plausible explanation for the fact that no decrease in overall employment is observed is that the dividend simultaneously increases income-generating consumption and creates more demand for labor. However, Jones and Marinescu (2019) note part-time employment increased. The share of people in the overall population that were employed part-time grew by 1.8 percent more compared to other states in the US after the introduction of the dividend payments in 1982 (Jones and Marinescu, 2019). Bibler, Guettabi and Reimer (2019) argue the dividend payments do have an effect on labor supply. Bibler et al. (2019) argue a 1,000 USD increase in the size of the dividend payment for every citizen would increase the chance of employment for someone by 1.8% over the following months. However, Bibler et al. (2019) argue similarly to Jones and Marinescu (2019) that over the long run part-time work seems to increase. Bibler et al. (2019) argue that every 1,000 USD increase in the size of the dividend payment will lead to a reduction of 0.7 working hours per week for men. For women the effect on the reduction of working hours is stronger at 0.9 hours per week for every 1,000 USD increase in the dividend payment. Bibler et al. (2019) note that the women that choose to reduce working hours have the general characteristics of being younger, lower-wage earners and having young children in the household. Feinberg and Kuhn (2018) studied the labor supply response of new residents of Alaska that started to receive dividend payments of the Permanent Fund. Feinberg and Kuhn (2018) argue that on average an 1% increase in household income by Permanent Fund dividend results in a person working 0.141% fewer hours that year. This response in labor supply was observed to differ based on characteristics. Feinberg and Kuhn (2018) note that the response of married women to the change in income was the strongest. Feinberg and Kuhn (2018) argue that a 1 percent change in household income by Permanent Fund dividend resulted in 0.17 to 0.18% reduction in working hours for married women, while reducing working hours by 0.138% for single women, and 0.115% for men.

The equitable distribution of oil revenue would in theory reduce income inequality. Goldsmith (2001) reasons that since the large share of revenue would be distributed to lower-income households this distribution would reduce income inequality. However, new findings by Kozminski and Beak (2017) argue that the dividend from the Alaska Permanent Fund has not reduced inequality in the short nor long run of the program. Kozminski and Beak (2017) reason that the income inequality not shrinking is due to differences in spending behavior. Kozminski and Beak (2017) reason that low-income households spend more on non-durable goods and high-income households tend to invest their dividend payments to create new income. However, this reasoning is at odds with the results from Kueng (2018). Kueng (2018) shows that the wealthiest households tend to spend their dividend payments the fastest compared to the poorest households. While the richest 20% of households spend 70% of the dividend payments in the first quartile. However, the poorest 20% of households spread out their dividend payment as such the poorest households spend only 10% of

their dividend payments in the first quartile (Kueng, 2018).

The Permanent Fund its Dividend payment has been effective at alleviating poverty for some groups. Berman (2018) studied the effect of the Permanent Fund dividend on the rural indigenous (Alaska Native) people. The rural indigenous people of Alaska are a population with historically high poverty rates that live in a region with limited economic opportunities. Berman (2018) argues that official poverty statistics underestimate the effect of dividend payments due to dividend payments being underreported. However, when data gets adjusted to include dividends the data show a significant reduction in poverty rates of rural indigenous Alaska Native people. Berman (2018) argues that by the year 2000 the dividend payments had lifted 12.4% of rural indigenous people out of poverty. As such, the Permanent Fund Dividend reduced 46% of poverty under indigenous people. The poverty alleviation effects are the largest among indigenous households with children. Furthermore, Berman (2018) notes poverty rates in multi-adult households are lower compared to single-parent households due to multi-adult households having increased labor participation. However, the effect of dividend payments to alleviate poverty has diminished over the recent years. Berman (2018) notes that between 2011 and 2015 the impact of the dividend had reduced to lifting 6.1% of rural indigenous people out of poverty. The reduction in poverty alleviation constitutes 22% of the poverty under the indigenous population instead of 46%.

To summarize, the Permanent Dividend Fund (PDF) is the longest-running basic income program that pays a dividend based on oil profits. The political management of the Permanent Dividend Fund shows difficulty due to the popularity of direct cash compared to future investments. Consumption of the dividend tends to be spread out throughout the year. The exception to spread-out consumption of the dividend are the richest 20% of recipients who tend to spend 70% of the dividend in the first quartile. The exception to spread-out consumption of the dividend are the richest 20% of recipients. The richest 20% of dividend recipients tend to spend 70% of the dividend in the first quartile. This consumption opposes spending theories about persistent wealth inequality. These spending theories were developed due to UBI payments showing no effect in reducing wealth inequality over the long run. Dividend payments have a positive effect on physical health. Babies are on average born 34.8 grams heavier in Alaska compared to similar U.S. states. On average, each 1,000 USD of dividend payments correlates with 17.7 grams. Additionally, babies have a higher metric on health tests shortly after birth. Furthermore, 3-year-old toddlers are measured to be obese less often. Health benefits primarily occur in lower-income households. Likewise, the poverty alleviation effect of the dividend payments occurs primarily in households with the characteristics of having children, being a single-adult household or being indigenous. Dividend payments are argued to create jobs in the short term but decreased working hours. As increases in dividend reduce working hours, having a stronger effect on women than men. Dividend payments have an effect on crime rates. While dividend payments reduce poverty-related crimes by 8% the payments simultaneously increase substance abuse crimes by 10%.

Keyna – GiveDirectly (2011-2013)

GiveDirectly is a New York-based charity NGO. As part of the mission of GiveDirectly the organization held a randomized controlled UBI study in Siaya County in western rural Kenya. Lowrey (2017) tells the goal of the experiment for GiveDirectly was to show that basic income is a cheap and scalable policy to aid the poorest on the planet. Lowrey (2017) tells the project was privately funded via donations. GiveDirectly received 24 million USD in donations for its basic-income effort. The received funds included donations from founders of Facebook, Instagram, eBay and Google. This support via donations of tech companies was not only due to philanthropic reasons, but also to provide proof of concept that basic income can work in a post-work future (Lowrey, 2017).

The direct cash transfer program was different from other programs. Haushofer and Shapiro (2016) tell that the program was explicitly unconditional, large, and concentrated during one period of time. Randomization was used both for which households would receive the UBI in the villages and which adult in the household (wife or husband) would receive the UBI. This meant that in one household the wife would be the recipient and in another household the husband would be the recipient. Haushofer and Shapiro (2016) explain that another element that randomly differentiated between households was the transfer format. The transfer format differentiated between lump-sum payments and monthly payments. The experiment ran for the duration of 9 months. The amount of the direct cash transfer differed from 404 USD in purchasing power parity (hereafter PPP) to 1,525 USD in PPP (Haushofer & Shapiro, 2016).

The experiment used characteristics of universal basic income. The experiment formally hands out money without a means-test. However, Lowrey (2017) tells the region of Kenya is not particularly wealthy. Additionally, participants were selected from the poorest villages and were admitted based on a simple asset test (if they had a thatched roof or not). Furthermore, the participants were required to have a mobile phone to access the payment application called M-Pesa. M-Pesa is used by an estimated 96% of Kenyan households (Lowrey, 2017). Haushofer and Shapiro (2016) note the experiment involved 503 randomized households receiving unconditional cash transfers. Additionally, the experiment involved 505 households in a spillover group to measure the effects of direct cash transfers to the wider community. Furthermore, a control group comprising of 432 households was part of the experiment (Haushofer & Shapiro, 2016).

Given the setting of the experiment is a less wealthy county in rural Kenya the replication of the experiments in other regions of the world might find different results. Lowrey (2017) describes the development level and living conditions of the villages in which the experiment takes place. Lowrey (2017) notes the villages of the experiment are poor for Kenyan standards. Examples that Lowrey (2017) give are that the access to the villages are by unmarked roads, the school in town is the only building with electricity and there is only one working water tap. Furthermore, the homes are made out of hilly brambles, there is no plumbing installation in the villages and households lack resources to dig latrines. Similarly, most farming is done by hand and eating in public is seen as boosting that a household has food which is considered rude (Lowrey, 2017). Lowrey (2017) tells that the villagers are familiar with in-kind development aid programs but not in-cash transfer programs.

The direct cash transfer program increased household investment and savings. Haushofer and Shapiro (2016) argue that households spend significantly more on food which was to invest in food security via household investment in livestock. Haushofer and Shapiro (2016) argue that if the recipient household received half of the highest direct transfer the children of the household were 42% less likely to go a day without food. During the experiment the amount households invested in livestock increased by 50% compared to the control group. Haushofer and Shapiro (2016) note that 12% of the overall average transfer amount was allocated to investing in livestock. Haushofer and Shapiro (2016) reason the increased investment will lead to increased agricultural yields and business

activities. Haushofer and Shapiro (2016) note that in the short timeframe of the study these investments did not have a significant effect on household income. Similarly, Haushofer and Shapiro (2016) tell household investment in durable goods increased. While the control group spent an average of 207 USD PPP compared to a 25% increase by the UBI group which spent an average of 260 USD PPP. Overall, an average of 7% of the direct transfer was used for durable goods. Haushofer and Shapiro (2016) note that durable assets households invested in were upgrades in housing like upgrades from thatched roofs to metal roofs. An upgrade to a metal roof would cost 669 USD PPP. The direct cash transfer policy increased the likelihood of the recipient having a metal roof by 24%. Around 16% of the control group had a metal roof when the experiment ended. Lowrey (2017) tells that overall, an average of 23% of the direct transfer was spent on metal roofing.

The amount of money a household received from the direct cash payment had an effect on the results. Haushofer and Shapiro (2016) argue that large sums of money produced a higher measurable metric on most outcomes. The larger sums of directly transferred cash created higher metrics for the outcomes of assets holding, consumption, food security, psychological well-being and female empowerment. Haushofer and Shapiro (2016) note that while larger cash transfers see households spending a higher amount of the transfer. However, the households that received large cash transfers spend a lower ratio of the large transaction compared to households receiving smaller cash transfers. Haushofer and Shapiro (2016) tell that the larger transaction is 3.77 times the amount of the smaller transaction. Households receiving the larger transaction spend 51 USD PPP on average compared to households receiving the smaller transaction which spent 30 USD PPP on average. Households receiving the larger transaction spend higher amounts of the transaction at a ratio of 1.7 compared to households receiving the smaller transaction (Haushofer & Shapiro, 2016).

The interval of receiving direct cash transfers has had an effect on household investment. Haushofer and Shapiro (2016) argue households receiving the direct transfer on a monthly basis were 12% less likely to invest in metal roofs. Moreover, Haushofer and Shapiro (2016) note that after the experiment ended monthly recipients had on average less credit than recipients of lump-sum payments. Haushofer and Shapiro (2016) argue this difference in credit is due to social behavior. Haushofer and Shapiro (2016) note that the saving options were available in the digital app used in the experiment for both recipients of lump-sum payments and recipients of monthly payments. Furthermore, part of the transfer money was also given away to family. Haushofer and Shapiro (2016) reason that monthly payments were not being saved for large investments which made it socially more difficult to refuse borrowing requests from family. Additionally, recipients of lump-sum payments had more time to plan their purchases. Due to the lump-sum payment on average being distributed halfway during the experiment (Haushofer and Shapiro, 2016).

No difference in consumption was found between lump-sum and monthly payment recipients. Haushofer and Shapiro (2016) argue that the differences in consumption range within 20% of the control group its mean for food expenditure and 85% of the mean for medicine expenditure. Although both groups have significantly higher non-durable consumption compared to the control group (Haushofer and Shapiro, 2016).

The time intervals for UBI payments create different spending outcomes. Haushofer and Shapiro (2016) argue that monthly transfers show a larger effect for households to gain food security. However, larger lump-sum payments allowed households to purchase more assets. A replication study by Wang and Luo (2019) found similar results that monthly transfers increase food security more and lump-sum payments increase asset holding. Haushofer and Shapiro (2016) also point out that Barrera-Osorio et al. (2008) argue that the timing of lump-sum payments can influence spending behavior. For instance, transferring lump-sum payments shortly before the date of school fees are due will result in more of the transfer being allocated towards paying school fees.

Non-durable consumption of households increased during the experiment. Haushofer and Shapiro (2016) argue the average consumption of the control group was comparable to 158 USD in PPP while the UBI group consumption was significantly increased to 194 USD in PPP. Haushofer and Shapiro (2016) note consumption grew in nearly all margins of non-durable spending with the exception of spending on alcohol and tobacco. The recipient households reported spending results which saw a decrease in alcohol spending. The average spending on alcohol by households in the experimental group was only 44% of the mean of the control group. Likewise, Haushofer and Shapiro (2016) argue the average consumption of tobacco by the UBI group was only 40% of the mean of the control group. Haushofer and Shapiro (2016) express concern that respondents may have given socially desirable answers due to the stigma that alcohol and tobacco carry. However, Haushofer and Shapiro (2016) reasons that social stigma did not affect the results due to no other results showing a similar bias. Additionally, Haushofer and Shapiro (2016) note that the survey questions had no direct reference to alcohol and tobacco expenditure. Moreover, the survey team was distinct from the intervention team. Haushofer and Shapiro (2016) argue the largest increase in non-durable spending of UBI receiving households was on food with an average increase of 19 USD in PPP (or 19%). The most substantial percentage increase was in spending on meat products which increased by 5 USD PPP (or 39%). While spending on staples (cereals) saw the lowest increase in percentage with a 2 USD PPP increase (or 10%). Spending on other non-durable consumption also increased significantly. Monthly spending on medical expenditure increased by 3 USD PPP (or 38%). Spending on education increased by 1 USD PPP (or 23%). Spending on social expenditures (like weddings, funerals, or leisure time) increased by 2 PPP (or 56%) (Haushofer & Shapiro, 2016).

UBI payments to female heads of household show different results compared to male heads of household. Haushofer and Shapiro (2016) argue that transfers to female heads of household have a slightly larger effect on female empowerment. Haushofer and Shapiro (2016) note that the effect on female empowerment is only statistically significant by a small margin. Furthermore, Haushofer and Shapiro (2016) note transfers to female heads of the household had a larger statistically significant effect on the psychological well-being of the household. However, transfers to females in households as opposed to males in households show no significant difference in spending. Haushofer and Shapiro (2016) argue the overall difference of female heads of household receiving UBI had no significant impact on consumption. Haushofer and Shapiro (2016) found the total expenditure of female heads of households to be corresponding with 18% of the mean of the control group. Moreover, food expenditure of female heads of household corresponded with 20% of the mean of the control group. On a final note, female heads of household were 11% less likely to invest in metal roofing (Haushofer & Shapiro, 2016).

The new income did not cause conflicts within households on how to spend the newfound income (Haushofer & Shapiro, 2016). Additionally, Lowrey (2017) argues that the direct cash transfer program reduced domestic violence. Although, Haushofer and Shapiro (2016) argue the results of the experiment show improved female empowerment by transferring money directly to females in the household. However, interviews reveal that husbands still often had the final say on how money was spent even if the experiment transferred the money to the wife in the household (Junior & Katz, 2016).

The females participating in the UBI experiment reported positive experiences during interviews. Junior and Katz (2016) argue recipients had a positive view of the direct cash transfers. As the UBI transfers helped in procuring basic needs. The female recipients said during interviews that they generally preferred direct cash transfer over in-kind development aid. Junior and Katz (2016) interpret the preference for direct cash transfers as a wish to convert the direct cash transfers into something that is longer-lasting such as income generation. Junior and Katz (2016) note that the interviewed females told as main advice toward future recipients to use the money for something

''visible'' or ''rememberable''. This is somewhat similar to the results of later interviews covered by Matthews (2017a). In the later interviews residents from multiple villages tell similar ideas to spend the money on investment and food security like seeds or fish feed, durable quality of life improvement like furniture (chairs and mattresses), buying a house or school fees (Matthews, 2017a). Junior and Katz (2016) argue that the interview responses of the UBI recipients do not only show the struggles associated with the lack of basic needs but also challenges the assumption that UBI transfers will be squandered.

The effects of the direct cash transfer persist after the program has ended. Haushofer and Shapiro (2016) argue the UBI payments have had some long-term effects. However, Haushofer and Shapiro (2016) note the effects of the UBI policy (like psychological well-being, health, education, and female empowerment) are strongest directly after the cash transfer and are reduced over time. One notable effect which remains after the experiment had ended is that the experiment had a significant effect on increasing the number of income-generating activities compared to the control group (Haushofer & Shapiro, 2016). A replication study from Wang and Luo (2019) found similar short-term effects of UBI payments as the original study from Haushofer and Shapiro (2016). The replication study from Wang and Luo (2019) found increases in asset holdings, consumption, monthly revenue, food security, and psychological well-being.

A later follow-up study by Haushofer and Shapiro (2018) found that three years after the UBI payments had ended, households which received direct transfers had 422 USD PPP (or 40%) more assets than control group households. The increased assets of the former recipients are equivalent to 60% of the initial transfers (Haushofer & Shapiro, 2018). The experiment had some spillover to other households in the village. Originally, the study by Haushofer and Shapiro (2016) found significant spillover increases in psychological well-being and female empowerment. However, Haushofer and Shapiro (2018) find that spillover households in the villages have lower rates of food consumption and food security than control households in other villages. More than three years after the experiment started, all differences between different types of UBI (lump-sum vs monthly transfer, male vs female, and large or small amount) seem to have faded (Haushofer & Shapiro, 2018).

Concluding, the UBI experiment done in one of the poorest regions in Kenya had several effects on the participants. Money from the UBI payment was spent to increase food security via livestock investment. Livestock assets in the test group grew by 50%. Moreover, children were 42% less likely to go a day without food. Overall, 12% of the UBI payments were spent on asset investment. Transfers to females in the household improved psychological well-being and female empowerment significantly more than transfers to males in households. However, females were 12% less likely than males to invest in home upgrades like metal roofing. Lump-sum payments were used more often for investment and monthly payments increased non-durable consumption. Researchers reason that monthly payments were more often lent to other members of the families compared to lump-sum payments. The effects of assets holding, consumption, food security, psychological well-being and female empowerment improved significantly more when higher amounts of money were transferred to the household.

Namibia - Otjivero and Omitara (2007-2009)

Namibia is a country in South-West Africa with a colonial history. The World Bank (2021) describes Namibia as one of the least populated nations in Africa with a population of around 2,5 million inhabitants. Namibia has a per capita income of 4800 USD as such the world bank classifies Namibia as a middle-income country. However, wealth inequality in the country is high which can be seen by Namibia its Gini coefficient of 0.58 (The World Bank, 2021). Dickson (2017) notes that the country of Namibia is one of the driest in sub-Saharan Africa. The dryness results in the need to import the majority of food consumed in Namibia. The economy of Namibia is largely based on mining diamonds and uranium (Dickson, 2017).

The Project known as Basic Income Grant (BIG) was funded by multiple NGOs. The BIG project is designed to create a policy target for development. During the project, 930 people lived in the settlement of Otjivero and the town of Omitara which is in the Omitara district (approximately 100 km from the Namibian capital Windhoek) (Ilcan & Lacey, 2015). Ilcan and Lacey (2015) tell the BIG pilot project ran for 24 months, from December 2007 to December 2009. The goal of the project was to influence the Namibian government to adopt a UBI policy. Haarmann et al. (2009) tell the effects of the project were measured by having the participants take a baseline survey in November 2007, and take another survey 12 months into the project. The project did not include a control group (Haarmann et al., 2009). The BIG project used key informants and several recipients for detailed qualitative case studies (Lacey, 2017). The recipients were children and adults under the age of 60 that received 100 Namibian Dollars (NAD) (approximately 15 USD) on a monthly basis (Petrova, 2020). The UBI was first transferred directly to the recipients but transfers were later handled through free savings bank accounts (Lacey, 2017).

Effects of the Basic Income Grant policy were observed after the 12-month survey. Haarmann et al. (2009) note that in the enthusiasm that followed with the implementation of the BIG policy the community had created an 18-member committee to advise with the spending of the BIG grant. For instance, Haarmann et al. (2009) note there were some recipients that squander their BIG on alcohol. The committee curbed alcoholism by making an agreement with local alcohol salesmen not to sell alcohol on the day the grant was paid-out (Haarmann et al., 2009).

One notable change after the introduction of UBI payments is the lowering of the average income in Otjivero and Omitara. Haarmann et al. (2009) argue that the average income has dropped from 89 NAD in January 2008 to 67 NAD in November 2008. Haarmann et al. (2009) tell this drop in average income is due to the large migration that Otjivero and Omitara attracted after the BIG was implemented. Haarmann et al. (2009) reason that even though the migrants do not receive BIG. The BIG policy still created a large pull factor for moving to the communities. As the introduction of the BIG led to an increase in economic activities.

Income generation activities increase in the communities that received BIG payments. Haarmann et al. (2009) note that one year after the introduction of the BIG policy, households generating income increased from 44% to 55%. The BIG policy has enabled the recipients to generate or increase work. Examples Haarmann et al. (2009) give of increased income generation as result of the BIG policy are recipients starting their own small business for brick making, dress-making, or baking bread. The generation of new income brought prosperity which was evident in the lower levels of debt. Haarmann et al. (2009) argue the average debt fell from 1,215 NAD in November 2007 to 772 NAD in November 2008. Savings also increased during the same period, which is reflected in the increase in ownership of livestock. Haarmann et al. (2009) argue that with more access to livestock, reported livestock theft dropped by 43%, and all other forms of theft dropped by 20%, and overall reported theft in the area dropped by 42%. Additionally, the creation of new forms of income

generations has had an empowering effect on women. The new forms of income generation have relieved women of the need to use transactional sex as means of income generation.

Criticism about the economic success of the BIG project in Otjivero and Omitara exists. Osterkamp (2013) argues that the BIG project had a lot of inconsistencies and unclarity with the results the project presented. The BIG project had no clear definitions e.g. income, no clarity for interview methods, inconsistency in presenting household data or personal data, and the effect of migration towards the community is unknown (Osterkamp, 2013). While Haarmann et al. (2009) argue that the results from the BIG project are sustainable. However, Osterkamp (2013) argues that based on the limited time of observation during the runtime such conclusions cannot be drawn. Furthermore, Osterkamp (2013) uses the example of the impression of local development from an interview done on a later date in May 2012 with the community leader of Otjivero, Ernst Gariseb, who said: *"For two decades we have been sitting here without work, development and prospects."* (published in the Allgemeine Zeitung on 7 May 2012). Notably, Ernst Gariseb did not mention any improvement of the 2008 BIG project. The unnoteworthiness of the BIG project does question the impact and sustainability of the improvements made during the BIG project (Osterkamp, 2013).

BIG payments reduced poverty in the local communities. Haarmann et al. (2009) argue that BIG payments reduced poverty after one year. Before the BIG policy, 76% of residents fell below the food poverty line. However, after one year the rate of residents that fell under the food poverty line was reduced to 37% of residents (new and old) of the local communities. Among households that previously lived in the community the rate of poverty dropped even more to 16% (Haarmann et al., 2009). The introduction of BIG saw many health-related benefits. Haarmann et al. (2009) tell that malnutrition in children dropped from 42% underweight before the introduction of the program to 17% after 6 months in June 2008. The reduction in food poverty continued to decrease and reached 10% of underweight in children by November 2008. Additionally, Haarmann et al. (2009) tell residents now use the local health clinic more. The local health clinic its income increased by fivefold due to the increase in visits.

BIG payments increased school attendance and reduced drop-out rates. Haarmann et al. (2009) argue that the pass rate under children of school-going age was 40% before the BIG payments started. Furthermore, drop-outs of children were frequent due to many parents not being able to afford school fees. After the BIG payments were introduced Haarmann et al. (2009) argue that the number of parents that were able to pay school fees increased to 90%. Likewise, the drop-out rate of children was reduced from 40% in November 2007 to 5% in June 2008, and the drop-out rate was further reduced to almost 0% by November 2008. Furthermore, more parents could now pay for their children to have uniforms and non-attendance due to financial reasons dropped by 42% (Haarmann et al., 2009).

The BIG project was perceived differently on a national and international level. Osterkamp (2013) notes that the BIG project in Namibia attracted public attention by gaining media coverage and attracted foreign supporters. However, the project was not able to reach the project goal of producing substantial arguments on important cases for political decision making. Osterkamp (2013) notes the BIG project did not provide any data for political decision-making about popular options of UBI policies. For optimal decision-making the UBI policy of the BIG project should have been compared to alternative social policies. A convincing argument for a new policy would be a comparison of both policies and how the new UBI policy would offer better value over the older one (Osterkamp, 2013). Osterkamp (2013) argues such data would be useful in a democratic system if a party would want to introduce a UBI policy. Since the large reform likely takes political support from a democratic mandate. Osterkamp (2013) notes that limited anecdotal evidence from letters sent to and published in newspapers exist condemning the experiment. Osterkamp (2013) notes that the compiled response is that reactors did not support a general policy that granted direct transfers to

everyone as money should particularly be allocated to the poor. Additionally respondents favored in-kind policies over direct transfers (Osterkamp, 2013). However, these reactions sent to the newspapers may have an inherent adversity bias.

The BIG project makes claims about alcohol usage but has little data to support the alcohol related claims. Osterkamp (2013) argues the BIG project could have tracked the sale of alcohol more closely by using the revenue of local alcohol salesmen. A similar strategy using key informants was used for the local health clinic. Osterkamp (2013) notes A similar approach of using the reported crimes of the local police station was also used to see how crime developed during the BIG project . However, while the local police station reported lower rates, particularly for livestock theft, this view is challenged by reports of nearby (mainly white) farmers. The nearby farmers claim to have averted contradictory development of crime (Osterkamp, 2013). A similar approach of using the reported crimes of the local police station was also used to see how crime developed during the BIG project. However, while the local police station reported lower rates, particularly for livestock theft, this view is challenged by reports of nearby (mainly white) farmers (Osterkamp, 2013). The research surrounding the BIG policy solely relied on local reported crime that excludes the possibility that crimes may have changed or deviated to other areas. Additionally, the need for committee intervention does raise questions about the validity of the claims surrounding no alcohol abuse. Moreover, no control group was used during the study. The lack of a control group does not give a clear distinction between changes due to the BIG policy or changes due to other developments during the runtime (Osterkamp, 2013).

In summary, the Basic Income Grant (BIG) project in Namibia from December 2007 to December 2009 showed several improvements. The communities receiving the payments saw large migration happening towards them. The communities organized a committee that advised spending the grant and became more socially active. Income-generating activities increased from 44% to 55% in the communities during the period BIG payments were made. Receiving BIG payments reduced living below the poverty line for residents from 76% to 16%. The BIG payment wealth trickled through the community reducing people living below the poverty line in the community to 36%. The BIG payments reduced malnutrition in children from 42% to 10%. The community could afford better access to the health clinic as evident by the fivefold increase in revenue of the health clinic. Household debt decreased and almost all parents were able to afford school fees which reduced the drop-out rate of children to almost 0% at the end of the experiment. The increased income-generating activities had an empowering effect on women as women no longer needed to engage in transactional sex. Crime in the area, particularly livestock theft, decreased by 42% overall. However, crime may have changed and interviews suggest that crime might have deviated to other areas. The original results report no increase in alcohol abuse. However, the newly formed committee did intervene with alcohol sales surrounding UBI payouts. The long-term impact of the BIG payments is disputed. While researchers claim the BIG payments improved living conditions in a durable manner. However, interviews 3 years after the BIG-program ended do not mention increased prosperity from the BIG-payments. Additionally, the study has been critiqued for several methodological failures, including not having a control group.

China - Macau (2008-present)

Macau is a city in southeastern China with a population of around 680,000 people (Cheng, 2017). Landler (1999) tells that after the 1999 transfer from Portugal to the People's Republic of China, that Macau its new government falls under the Macau Special Administrative Region (MSAR). The MSAR grants the Macau government a greater degree of administrative freedom from other parts of China (Landler, 1999). Ewing (2007) tells that when in 2004 Macau legalized gambling that the capital investment of the new Casino was earned back within a year. The casino of Macau became the largest gambling hub in the world as the casino attracted people from other parts of China where gambling is prohibited (Ewing, 2007). Kwong (2013) notes that although the MSAR benefits from the gaming revenue the MSAR did not increase social welfare. However, in 2006 the MSAR raised the basic salaries for public servants. Kwong (2013) notes that originally as response to ease of hardships and inflation from the 2008 Great Recession the government of Macau introduced the Wealth Partaking Scheme (WSP hereafter). The WSP was supposed to be a one-off wealth transfer. Kwong (2013) notes that at the time Macau was economically well off in comparison to other parts of the world during the 2008 Great Recession. As Macau had an unemployment rate of 3%, GDP growth of 14.6%, and a per capita GDP increase of 10.5%.

Distribution of the WPS differs between residents and citizens. Kwong (2013) tells that distribution of the WSP is done to all holders of the Macau Resident Identity Card. The payment amount differentiates between permanent residents and non-permanent residents, receiving 5,000 Macau pataca (MOP) (or around 625 USD) and 3,000 MOP (or around 375 USD) respectively (Kwong, 2013; XE, n.d.).

The WPS policy was conceptualized in a governmental climate with low legitimacy.

The MSAR made several social policy changes in a period of a few years. Lai (2010) notes numerous changes to social welfare during the years of 2007 and 2008. As Lai (2010) notes that economic growth alone could not offer the MSAR government legitimacy and social unrest ensued. However, Lai (2010) argues that the MSAR continued the strategy to rely on foreign workers needed to sustain economic growth. This strategy caused social unrest and issues for legitimacy. An example of social unrest happened in regards to the housing market where the market was out of government control (Lai, 2010). Thus the MSAR government made the strategy of restoring legitimacy by continuing the economic growth while investing in social policy. Lai (2010) notes examples of newly introduced social provisions in 2008 such as extending free education to 15-year-old children throughout the year 2008, a rental allowance for low-income households waiting for social housing units or the aforementioned Wealth Partaking Scheme. The reforms of the MSAR during the 2007 to 2008 period differed from earlier reforms in the period from 2002 to 2005. Lai (2010) argues the reforms of 2007 and 2008 were not focused on disciplining via social policy like the 2002 till 2005 reform but rather on gaining legitimacy.

Similarly, Kwong (2013) notes that the policy may have been implemented specifically to quell May Day (Labor Day) demonstrators. Kwong (2013) reasons the May Day demonstration of 2008 was surrounding the lack of affordable housing and might have been amplified by a bribery scandal coming to light. The WSP payments may have been to offset the negative publicity from the bribery scandal. In the following year of 2009, Kwong (2013) argues Macau would see a reduction in the amount of May Day protestors but only for one year. However, Kwong (2013) notes that the number of May Day protesters would continue to increase from 1,000 in 2008, and while dropping to 400 protestors in 2009, the number of May Day protestors would increase to 2,000 in 2010. The following years also saw high levels of May Day protest attendance. With 2,300 people attending the May Day protests in 2011, and 1,400 people attending the May Day protests in 2012 (Kwong 2013).

The official reason behind the WPS changed annually. Kwong (2013) notes that the official explanation for the WPS policy that was decided to be annually extended changed on a yearly basis. During the Great Recession of 2008 the official reason for the WPS was global inflation. The reason for the WPS changed to community well-being in 2009. And in 2010 the government declared the intent to curb the direct cash transfers of the WPS into a social welfare policy. However, Kwong (2013) notes that in 2011 a few months before the payout date of the WPS that the neighboring city of Hong Kong also declared a direct cash transfer policy but with a higher payout. Kwong (2013) argues the Hong Kong transfers made gradually fading out the WPS policy harder when the neighboring city of Hong Kong also introduced an annual basic income that paid out more. For the following years, Kwong (2013) tells the WSP would pay out more than double of the previous payout amount and the payout matched Hong Kong its payout in monetary value with the official reason of sharing the fruits of Macau its economic prosperity. Kwong (2013) concludes that the direct cash payout might have temporarily fostered societal cooperation. However, the public its discontent will still erupt if the perceived ineffective governance persists. Politicians should estimate if the economic situation is critical and stimulus is necessitated or whether the direct cash payments are appeasement policies (Kwong, 2013). Lai (2010) concludes that welfare policies in the East-Asia region are primarily to serve the economic and political objectives of the elite in advanced capitalist structures.

The Wealth Partaking Scheme is a double-edged sword for the government. Chong and Jin (2016) argue that the WPS payments may have reduced unrest and created stability when introduced. However, the effects of the WPS payments of reducing unrest diminished over time. Chong and Jin (2016) argue similar to Kwong (2013) in that ultimately the grievances of the people with the ineffective government will resurge. Chong and Jin (2016) adds to this that while the source of revenue from casino gambling is drying up, the WSP becomes more pressing on the government budget. However, the effect of giving the MSAR government more legitimacy has faded. Stopping the WPS payment policy can likely create more issues with government legitimacy and create instability (Chong & Jin, 2016). Chong and Jin (2016) argue that the WSP policy ultimately does more harm than good. However, Chong and Jin (2016) reason that reversing the WSP policy comes with several hurdles. Example being that recipients have gotten adjusted to the extra income. Phasing out the WSP policy would gradually allow this transition without bringing financial hardship to recipients (Chong & Jin, 2016). Additionally, Chong and Jin (2016) argue reverting the WSP policy would be a loss of face for MSAR. Overall, changing the WSP policy in a way that negatively affects citizens is a tough bullet to bite.

The diminishing gambling revenue for Macau means changes to public spending may be needed. Vinnicombe and Sou (2019) note that the casino driven economic boom that has boosted the economy of Macau for over a decade has started drying up. 80% to 90% of the MSAR its income comes from taxation on casino revenue. A diminishing casino revenue means less budget for the Macau government (Vinnicombe & Sou, 2019).

Recipients of WSP were willing to give up some of their WSP to help fund other government expenditures. Vinnicombe and Sou (2019) surveyed 203 orchestra visitors of the Macau Orchestra about the funding for the Orchestra. Vinnicombe and Sou (2019) argue that 6.9% of respondents would not be willing to give up any part of their WSP for the Macau Orchestra. As a comparison, other studies measuring Macau and the residents their willingness to pay report higher percentages of unwillingness to pay (Vinnicombe & Sou, 2019). For example, Jin (2007) found that 35% of the Macau public was not willing to pay for the conservation of exotic bird species. Another comparison for willingness to pay research is Song, Wang and Li (2012). Song et al. (2012) found that 37.97% of Macau residents were not willing to pay for the recycling of e-waste. Most recipients that refused to pay in the survey done by Vinnicombe and Sou (2019) answered that it is the government its

responsibility to balance its budget and that the government should use its other assets more wisely. Vinnicombe and Sou (2019) note other responses of unwillingness were that the government should balance spending between the economy and cultural goods such as an Orchestra (Vinnicombe & Sou, 2019). The willingness to pay for the orchestra differs greatly from similar studies. With around 7% of respondents refusing to pay compared to around 35% of respondents refusing to pay in other studies. The higher willingness to pay might indicate that recipients of direct cash grants are more willing to part with the money for other (public) benefits. However, the fact the survey was done with respondents visiting the orchestra does bring into question the validity to generalize these results to all residents of Macau.

WSP recipients had different attitudes towards giving up part of their WSP based on the respondents characteristics. Vinnicombe and Sou (2019) argue recipients born in Macau were statistically significantly more willing to give part of their WSP for the Orchestra. Showing greater commitment to the community when one is born into the community. Furthermore, Vinnicombe and Sou (2019) found that recipients that had higher education levels showed a lower willingness to give up their WSP payments for public works. People that received higher education or had white collar jobs were less likely to be willing to give up part of their WSP payments for other public goods (Vinnicombe & Sou, 2019). Lower willingness to pay by the higher educated and white color workers differs from similar studies like Chang and Mahadevan (2014).

Frequent use of a public good does not increase the willingness to pay for that public good. Vinnicombe and Sou (2019) did not find a significant difference for the variable *''Aficionado''*. The variable *''Aficionado''* means someone devoted to the Macau Orchestra and was operationalized as: someone that goes to 5 or more performances a year, someone that spends 500 MOP or more annually on the orchestra , or someone that is a ''friend'' of the orchestra. Meaning that someone that uses a public good would not be more likely to give up part of their WSP payment for that public good (Vinnicombe & Sou, 2019).

To summarize, the Wealth Partaking Scheme (WPS) may have been introduced as an appeasement policy instead of a response to the 2008 Great Recession. Appeasement was initially intended to be temporary. However, after the appeasement the public its grievances with the MSAR administration persisted. When the neighboring administration of Hong Kong introduced a similar direct cash transfer policy the public its perception of the WPS changed from an allowance or grant to an expectation. With the economic growth of the MSAR slowing down and the legitimacy effect of the WPS policy diminishing over time the WPS is viewed as more harmful than good. However, revoking the policy is difficult as recipients have become dependent and revoking the policy might cause new political grievances resulting in instability. Instability would mean the loss of face for the MSAR government. However, research suggests recipients might be very willing to give up the direct cash payments for other policies.

China - Hong Kong (2011, 2018, 2020 & 2021)

Hong Kong is an island city (with mainland territories) off the coast of the southeast mainland of China with a population of around 7 million people. Gargan (1997) tells that after the 1997 transfer of Hong Kong from The British empire to China the Hong Kong Special Administrative Region (HKSAR) was formed within the People's Republic of China. The HKSAR is granted more administrative freedom compared to mainland China (Gargan, 1997). Prochazka (2017) notes that while Hong Kong is a wealthy region within China, Hong Kong does have a persistent poverty rate of 20%. The 20% poverty rate is not relative to Hong Kong its high income. As homelessness due to the high cost of housing happens frequently in Hong Kong. Additionally, Hong Kong also knows low social mobility, wage stagnation and a high level of economic inequality (Prochazka, 2017).

The idea of universal cash payments is not new for Hong Kong. Burns (2004) tells that during colonial rule in the 1990s a similar idea of a direct cash transfer for 5,000 Hong Kong Dollar (HKD) to all Hong Kong people already existed. However, the idea was scrapped when Hong Kong its economic situation worsened (Burns, 2004).

In 2011, the HKSAK budget planned a one-time 6,000 HKD (or around 770 USD) direct cash transfer to the Mandatory Provident Fund (MPF) account of all qualified citizens to combat inflation (XE, n.d.). All together the injection into MPF accounts of citizens was estimated to cost 24 billion HKD of the 2011-2012 budget (Tsang, 2011). However, Kwong (2013) tells the plans for the transfer to the MPF were met with widespread criticism and disappointment for the ineffectiveness in helping relieve inflation. Citizens criticized that the measure would not help with their immediate needs because the money would only become available after retirement at the age of 65 years old (Kwong, 2013). Kwong (2013) notes that additional problems with the policy were that Hong Kong's 127,000 civil servants and 60,000 teachers did not qualify for the policy due to not being MPF participants. The proposed transfer to the MPF aroused discontent from its Hong Kong teacher and civil servant unions that were threatening with strikes (Kwong, 2013). Kwong (2013) argues that the awareness of the direct cash handout in neighboring Macau together with concerns about hyperinflation and an impending economic recession sparked non-violent anti-government action. Kwong (2013) notes that an opinion poll conducted by Hong Kong University found that 53% of respondents were dissatisfied with the proposal. The chairwomen of the Liberal Party used the opinion poll to call out that the public wanted direct cash handouts. Furthermore, Kwong (2013) notes that politically the MPF transfer did not get any support from pro-establishment political parties.

Public unrest and public grievances resulted in a backroom meeting to create a direct cash policy. Kwong (2013) notes that since the Hong Kong administration has no inherent support the administration relied on patron-client relations with the legislative body to ensure sufficient support. The Hong Kong administration found legislative support for the direct cash transfer by meeting with pro-establishment politicians. After the meeting both administration and legislation gave a joint press conference in support of the new policy. This joint press conference was a save of face for the administration (Kwong, 2013). However, Kwong (2013) notes that a possible exchange for other policy proposals may have driven the cooperation.

Contrasting reactions exist to the direct cash policy. Zarathustra (2011) argues that the direct cash policy is political suicide for the government. Zarathustra (2011) argues that a government distributing money without a clear vision or long-term focus while ignoring problems that face Hong Kong will only create more problems than the direct cash distribution solves. Similarly, Kwong (2013) argues the money would be better reserved to use in case of a more severe economic downturn. Kwong (2013) notes that 2010 was an economic growth year for Hong Kong with GDP increasing by

7.3%and GDP per capita increasing by 6.6%. Where Kwong (2013) and Zarathustra (2011) differ is the loss of face that is perceived to happen to the Hong Kong government. While Zarathustra (2011) calls caving to public demand a government failure and argues it hurts the government its credibility. Kwong (2013) argues the administration formed a clientelist relation with the pro-establishment parties for the direct cash policy which saved face for both legislative and administrative elements of government.

The direct cash transfer policy would be used multiple times in Hong Kong after the initial use in 2011. Although initially, no politician requested the policy to return in the 2012 budget (Kwong, 2013). Years later, the Hong Kong government would issue a direct cash *''Caring and Sharing Scheme''* in March of 2018. Xuequan (2018) tells the Caring and Sharing Scheme paid out 4,000 HKD (about 500 USD) to the suspected 2,8 million unemployed residents of Hong Kong and the scheme is estimated to cost 11 billion HKD. Eligibility for the Caring and Sharing Scheme is decided by whether a resident pays a salary tax or not. Additionally, to be eligible a resident cannot own property or receive any comprehensive social security payment like old age allowance (Xuequan, 2018).

The year 2020 would see another return of direct cash payments in Hong Kong. Lam (2020) tells that in February of 2020 the Hong Kong government announced a 120 Billion HKD direct cash transfer policy. Under the new policy around 7 million residents of age 18 or older are eligible to receive 10,000 HKD (or 1,283 USD) (Lam, 2020). Lam (2020) notes the official reason for this policy was that the Economy of Hong Kong had entered into recession in the third quarter of 2019. Furthermore, the year 2019 as a whole saw low economic GDP growth for Hong Kong standards at 1.2% GDP growth (Lam, 2020). BBC (2020) notes three other reasons for the direct cash transfers. The first reason for the direct cash transfer is that the Hong Kong government had already promised a relief fund for the novel-coronavirus. The second reason that BBC (2020) notes for the direct cash transfer is that the Hong Kong economy was negatively affected by the US-China trade war. The third reason for the cash transfers was to calm the political unrest of the anti-extradition law protests in Hong Kong (BBC, 2020). Chung (2020) tells the handout policy was criticized for its eligibility. While Hong Kong residents that left the city would still be eligible. However, recent immigrants that moved into Hong Kong would not be eligible for the direct cash transfers (Chung, 2020).

For the following year of 2021 the Hong Kong government would again use a direct-cash policy. Magramo (2021) argues that the cause for the direct cash policy in 2021 was as response to unemployment during the lockdowns of the COVID-19 pandemic and the persisting political turmoil of 2019-2020 anti-extradition law protests. These causes resulted in the Hong Kong government adopting a 5,000 HKD (or 643 USD) e-voucher program. The e-voucher program would distribute an amount of 5,000 HKD over 5 months in installments of 1,000 HKD each. The e-voucher program was estimated to cost 36 billion HKD (Magramo, 2021). Leung, Low, Choy, and Yeo (2021) argue that many residents viewed the e-voucher as ‘‘better than nothing’’. As many residents would have preferred in-cash transfers over the e-vouchers. Furthermore, the use of e-vouchers caused several usage problems as the platform used for the e-vouchers was not able to process some payments (Lueng et al., 2021).

To summarize, the Hong Kong administration has used direct cash transfers several times over the past decades. The Hong Kong government used direct cash transfers in 2011 officially for economic reasons however the policy use coincided with political unrest. In 2018 the Hong Kong government used the policy for social aid to the unemployed. In 2020 the HKSAR used direct cash transfers for economic reasons which coincided with political unrest and the start of the COVID-19 pandemic. And in 2021 the HKSAR handed out e-vouchers instead of direct cash transfers for economic reasons, as recovery from the COVID-19 pandemic and against previous political unrest. The use of direct cash policies has been criticized for its use in relative economic good times or its relative ineffectiveness due to not directly addressing some problems. On several occasions the

public showed a preference for direct cash transfer over receiving e-vouchers or transfer to pension funds. The preference and familiarity with direct transfers may affect political debate. As familiarity with direct cash policies encourages advocating for direct cash transfer as an alternative for disliked government policies.

The Netherlands – Weten wat werkt (2018-2019)

The experiment ‘‘Weten wat werkt’’ (meaning: knowing what works) was an Dutch UBI experiment with the goal of finding the best way of delivering financial assistance to unemployed people. Sanders et al. (2020) tell that the experiment focused on the existing income support policy of the Participation law, commonly known as ‘‘bijstand’’. This income support policy is serviced at a municipal level and is used as a last resort when the applicant is not eligible for other social policies. Sanders et al.(2020) notes the experiment was initially planned in the municipalities of Utrecht and Zeist with 752 and 35 volunteer recipients of income support from respective municipalities. The municipalities respectively count a total 12,500 and 1,400 income support recipients (Sanders et al., 2020).

When other municipalities set up similar experiments a combined study was organized. Among those municipalities are Deventer (n=695), Tilburg (n=780), Nijmegen (=289), Groningen (n=890) and Wageningen (n=410) (Sanders et al., 2020). The municipalities shared data with the Central Bureau of Statistics (CBS). The CBS compared the data between the municipalities. Even though the experiment was originally planned to test UBI. However, doubt from the national Undersecretary of Social Affairs resulted in a broader experiment that tested multiple alternatives to the current income support instead of exclusively testing UBI (Nederlandse Omroep Stichting [NOS], 2017).

Not all income support recipients were allowed to participate in the experiment. Verlaat et al. (2020) tell some groups were not allowed to participate in the experiment due to certain risks. Verlaat et al. (2020) note the groups that were not allowed to participate are refugees that have not completed the integration requirements, youth under 27-years old, or elderly income support recipients who were close to retirement. All participants were recipients of income support that volunteered for the experiment (Verlaat et al., 2020).

The study had different test groups and a control group. Sanders et al. (2020) tell the recipients were randomly divided into four groups. Each group had different characteristics of a plausible welfare policy to test the different effects of the respective policies. Sanders et al. (2020) tell that the first group was a control group of current income support recipients that had voluntarily registered to help with the experiment. Sanders et al. (2020) note the second group, the self-action group, was relieved of their job searching obligation and the obligation to accept work. The self-action group had no responsibilities but could use the job-training programs from their municipality of their own volition. The municipality would contact the people in the self-action group to ask how they were doing every 6 months (Sanders et al., 2020). Sanders et al. (2020) tell that the third group, the extra help action group, got more intensive and personal help from the municipality. The help was cooperative, meaning the social worker and the income support recipient would design an individual action plan together. The frequency of contact moments between the social worker and recipient would be double that of the control group (Sanders et al., 2020). Sanders et al. (2020) note that in the fourth group, the working pays group, the income support recipients were allowed to keep 50% of income from labor (instead of the regular 25%) up to a maximum of 202 Euro (EUR) (221 USD) per month. The aim of the working pays group was to test if the financial incentive would increase employment gained. All groups of income support recipients received around 1,045 EUR (1,145 USD) a month (Sanders et al., 2020). Verlaat et al. (2020) tell that the participants in the experiment would receive a survey three times during the period the experiment ran between June 2018 to October 2019. Residents living in Utrecht were present in all four groups while residents from Zeist were only assigned to the first and fourth groups (Verlaat et al., 2020). Sanders et al. (2020) note the cities of Tilburg and Nijmegen added the working pays program to the self-help and

extra help action program. Additionally, the city of Groningen allowed some recipients to choose the program and randomly assigned other recipients (Sanders et al., 2020).

Of the experimental groups the second group, the self-action group, mimics a basic income due to income being guaranteed without strings attached. The experiments were designed to investigate if a basic income type of policy is more likely to increase the chance of an income support recipient gaining a new income via employment. The working pays experimental group investigates the effect of financial incentives which would also be present in a basic income compared to financial assistance. A combination of the self-help and working pays group is also tested in Nijmegen, Tilburg, and Deventer. The contrast is that basic income would not have a limit on the incentive. Furthermore, by testing intensive social help via the extra help action group the research can also gain insight into the comparative effect and efficiency of different social programs. This insight could offer an argument for adopting a specific policy rather than solely testing basic income.

The different groups increased the chance of gaining new employment. Verlaat et al. (2020) argue that all experimental groups were more likely to gain employment during the experiment in Utrecht and Zeist. For the research employment was defined as earning 70% of the minimum wage (0.7 FTE on minimum wage). The results are shown in figure 12. Figure 12 shows all groups have similar starting points of around 3% of income support recipients finding employment in the first month. However, Verlaat et al. (2020) note in the 16 months that followed the difference between the experimental groups and the control group grew. The difference ranged from 7% of employment gain in the control group to the highest 12% employment gained in the self-action group (Verlaat et al., 2020). Verlaat et al. (2020) note that from the 12th month and onward that all experimental groups see higher levels of employment gain than the control group. Although the self-action group was on average the likeliest to have found employment after the 16 months period at 3.9 percentage points higher than the control group. However, the result is statistically insignificant even when tested at a confidence interval of 90% (Verlaat et al., 2020). Verlaat et al. (2020) note that of the recipients of the self-help group that the 90% confidence interval (CI) of the population was between -0.9% employment gain and 8.8% compared to the control group. Verlaat et al. (2020) note that the results of the extra help action group were similar to the self-action group. While the extra help action group had a 4.0 percentage points higher average employment gain compared to the control group. However, the results of the extra help action group were not statically significant at a confidence interval of 90%. The work pays group gained less employment compared to the other experimental groups. Furthermore, the graphic of figure 12 suggests that the extra help action group saw increases in employment sooner than the self-action or working pays groups (Verlaat et al., 2020).

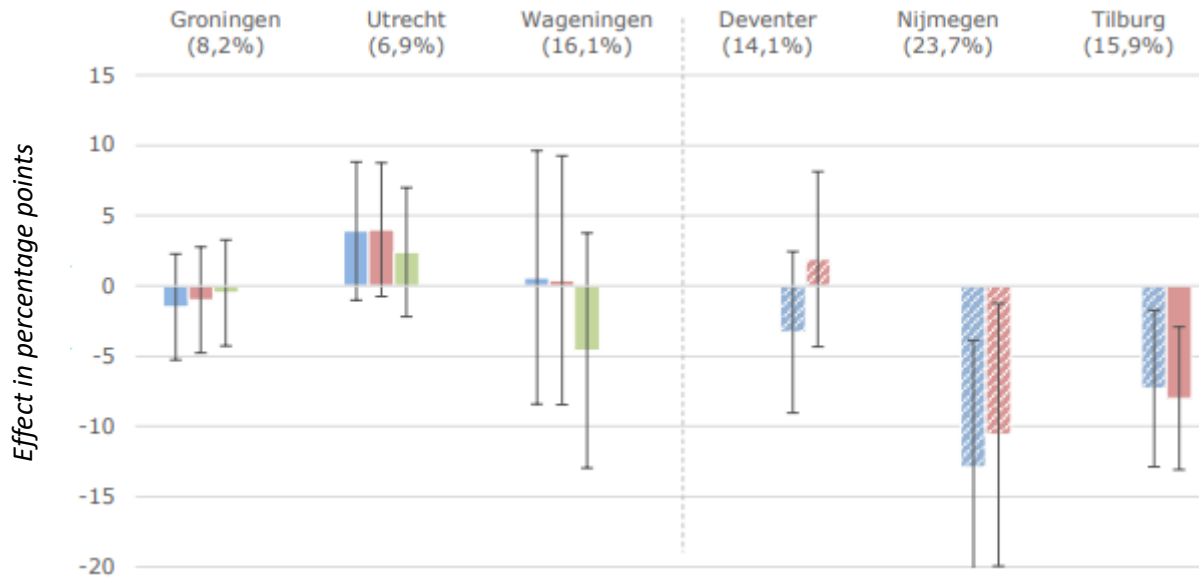
Figure 12: Probability of gaining 70% minimum wage employment per experimental group in Utrecht

Black = Control group
Blue = Self-action group
Red = Extra help action group
Yellow = Working pays group

Retrieved from verlaat et al. (2020)

The probability of an income support recipient earning 70% of the minimum wage via employment differs between cities. Sanders et al. (2020) argue that the overall result for gaining employment which earns 70% of the minimum wage is negative for all experimental groups as shown in figure 13. Sanders et al. (2020) argue that when looking at the overall results between cities for gaining employment that earns 70% or more of a minimum wage position that the effect on gaining employment in the cities of Utrecht, Groningen, Wageningen and Deventer was statistically insignificant. However, Sanders et al. (2020) argue the negative effect on employment for the cities of Nijmegen and Tilburg for both the self-help and extra help action group are statistically significant. However, De Boer, Bolhaar, Jongen and Zulkarnain (2020) note that the negative effect in Nijmegen might have been due to the statistical chance of all promising recipients of income support being assigned to the control group. Similarly, in the Tilburg experiment the recipients might have been affected by the test effect strengthened by media coverage of the experiment. De Boer et al. (2020) argue that the test effect could have made it so that the control group may have behaved differently.

Figure 13: Probability of gaining 70% minimum wage employment per city



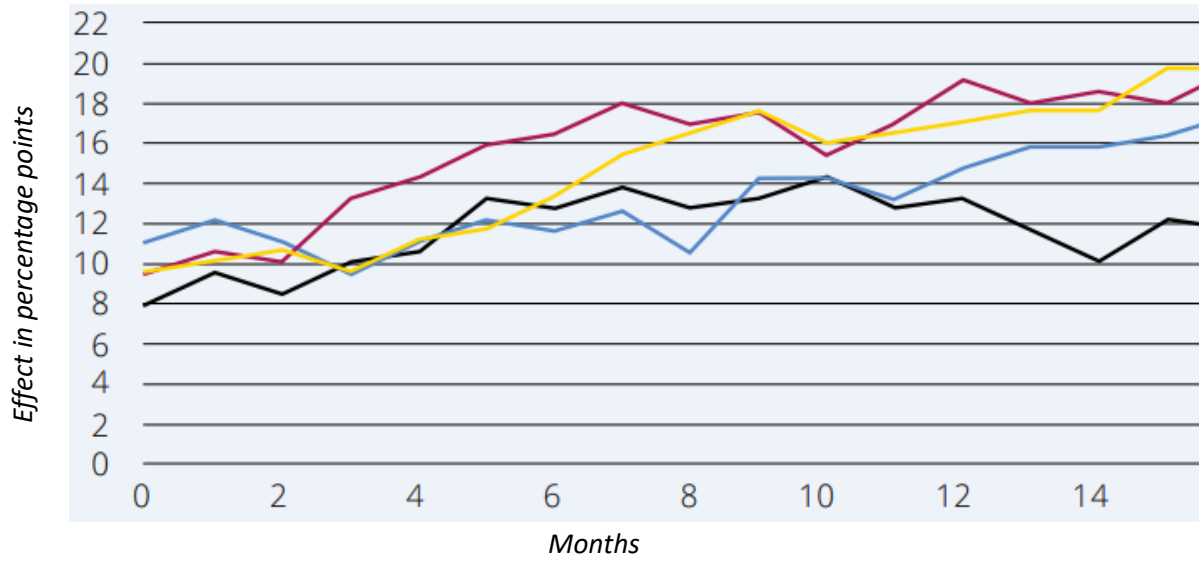
Blue = Self-action group Red = Extra help action group
Green = Working pays group White lines = Combination group with working pays incentive
** The line represents the 90% confidence interval*
*** the average for each experiment is shown under the name in brackets*

Retrieved from Sanders et al. (2020)

The different experimental groups of the income support policy affected the chance of gaining hours of employment differently in the city of Utrecht. Verlaat et al. (2020) argue that the intensive extra help action approach and the incentivized working pays approach yielded the largest effects in hourly employment growth for recipients in Utrecht and Zeist. The results of the experiment on employment gain defined as working 12 hours or more show that the intensive approach of the extra help action group helped the most people gain employment (Verlaat et al., 2020). Figure 14 shows the improvement when looking at the number of people that worked 12 hours or more. Looking at the number of recipients that were able to gain 12 hours or more of employment shows a larger increase in the results of the extra-help action group and the working pays group. The extra help action group and working pays were able to gain employment at a higher rate than other experimental groups. Verlaat et al. (2020) note that out of the control group, 11.7% of recipients had gained employment working 12 hours or more after 16 months. Verlaat et al. (2020) argue that compared to the control group, the extra help action group shows a statistically significant increase in employment gain of 18.1% (6.4% more) by recipients that gain 12 hours or more of employment. Verlaat et al. (2020) argues the working pays group shows an increase in employment that is statistically significant when employment is defined as working 8 hours or more. While the working pays group did increase the likelihood of a recipient gaining some employment. However, Verlaat et al. (2020) note that the recipients in the working pays group stuck to the job recipients had gained more often and recipients did not further increase their hours worked within that job.

Some of the recipients had found some form of employment prior to the start of the experiment. Verlaat et al. (2020) note that 100% of the recipients in the working pay group retained their prior found employment compared to 75% of the control group. Verlaat et al. (2020) note that the self-help group shows a negative effect on early employment gained but the effect gets adjusted before the end of the experiment. Verlaat et al. (2020) note that in interviews recipients in the self-help group answered they had to get used to relying on themself. Additionally, the self-help recipients tell they used the early period of the experiment to quietly orient themselves on their new situation.

Figure 14: Probability of gaining employment for less than 12 hour a week per experimental group in Utrecht



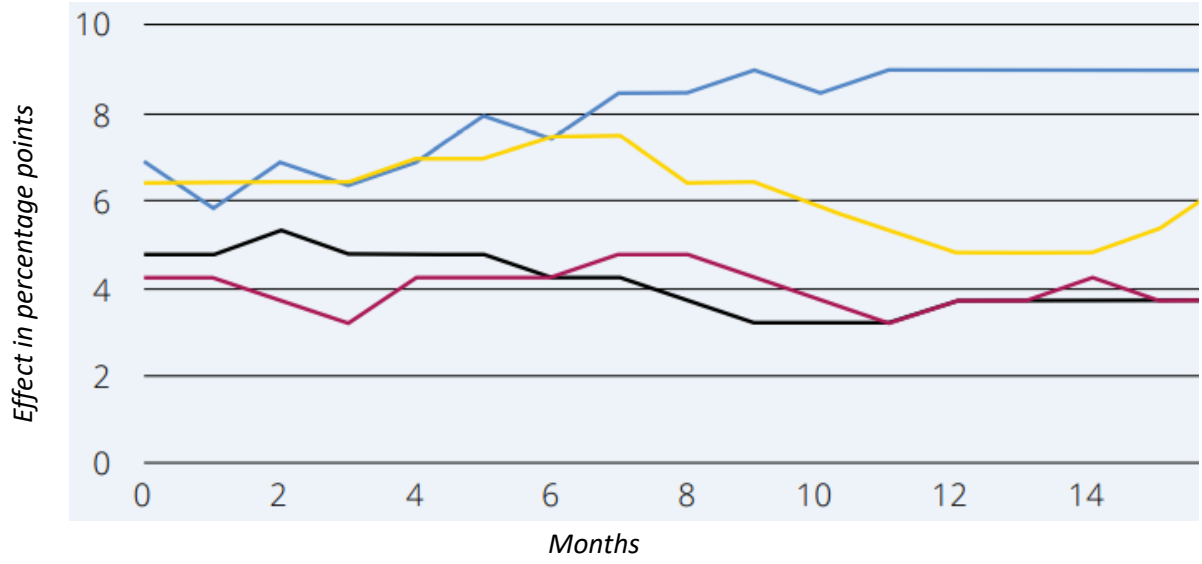
Black = Control group
Blue = Self-action group
Red = Extra help action group
Yellow = Working pays group

Retrieved from verlaat et al. (2020)

However, Utrecht (and Zeist) is the only city in the experiment with the positive effect of creating small jobs. Sanders et al. (2020) argue that when looking at other cities the effect of increasing the small number of hours worked (8 hours) in the experimental group with the exception of Utrecht are all negative. Sanders et al. (2020) argue that although most effects in each individual city are not statistically significant. With the exception being the negative effect on small jobs seen in the city of Nijmegen is significant at a Confidence level of 90%. The experiment in Nijmegen had an average decrease of 44.3% in gaining 8 hours of employment. Moreover, Sanders et al. (2020) argue that the effects of gaining employment become smaller but the results tend to get more positive when looking at employment of larger jobs with more hours worked. However, Sanders et al. (2020) note that the reduction of the negative effect in Tilburg in the extra help action group compared to the 8-hour jobs is significant. Sanders et al. (2020) note that overall in the whole study the effect of the extra help action group has fewer negative results. Although the effect of the extra help action group is not statically significant. The non-significant increase in the gain of employment of the extra help action group correlated more with long-time unemployment (Sanders et al., 2020). However, if a positive effect is carried by people that have been long-term unemployed, then success will diminish as this group gains employment and the effect of the extra help action group as policy is less sustainable.

The probability of gaining permanent employment differs between experimental groups. A permanent employment contract can be seen as offering more stability compared to a temporary employment contract. Verlaat et al. (2020) argue that for the Utrecht experiment the self-action group appears to give a higher probability of gaining permanent employment, as can be seen in figure 15. Recipients in Utrecht and Zeist in the self-help group found permanent employment at higher rates (Verlaat et al., 2020). Verlaat et al. (2020) argue that 3.7% of recipients in the control group gained permanent employment compared to 7.3% of recipients in the self-help group. Other experimental groups seem to have similar results to gaining permanent employment as the control group. However, Verlaat et al. (2020) note that the overall difference in gaining permanent employment is not statistically significant. The difference in gaining permanent employment for the self-help group briefly became statistically significant at the 11-month point of the experiment. Verlaat et al. (2020) note that in interviews recipients in the self-help group tell the increased amount of autonomy and no responsibility to accept work made the recipient more critical about accepting employment. The increased autonomy and lack of responsibility allowed recipients to choose employment that offered more long-term stability instead of temporary employment. Although the increase in permanent employment for the self-help group remains statistically insignificant overall.

Figure 15: Probability of gaining permanent employment per experimental group in Utrecht

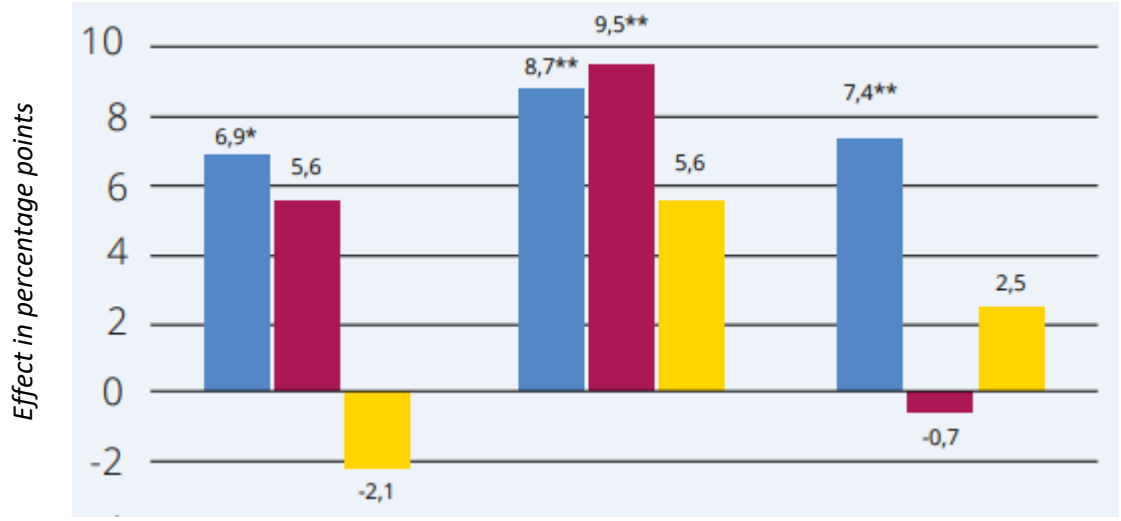


Black = Control group
Blue = Self-action group
Red = Extra help action group
Yellow = Working pays group

Retrieved from verlaat et al. (2020)

The effect of gaining employment differs based on the educational level of recipients. Verlaat et al. (2020) argue the effect of the different experimental groups in Utrecht are predominantly carried by people with lower education levels. A lower educational level was defined as someone who did not finish high school at a college entry-level or has not completed vocational training. The disparity in education level can be seen in figure 16 and figure 17. Verlaat et al. (2020) argue recipients with a lower level of education benefited significantly more from the experimental programs. The self-help group has statistically significant results in all three categories of gaining employment for recipients with a lower level of education (Verlaat et al., 2020).

Figure 16: Effects of experimental group on recipients with lower levels of education in Utrecht



Blue = Self-action group Red = Extra help action group Yellow = Working pays group
Statically significant is show by * at the 10% level and ** at the 5% level.

Retrieved from verlaat et al. (2020)

Verlaat et al. (2020) argue the self-action group has a statistically significant 6.9 percentage points positive effect on employment for gaining 70% of the minimum wage income for recipients with a lower level of education. Furthermore, Verlaat et al. (2020) argue that the self-action group shows a statistically significant 8.9 percentage points improvement when looking at working 12 hours or more for recipients with a lower level of education. Verlaat et al. (2020) note the path to an employment contract for recipients with a lower level of education is statistically significantly higher with the self-action group. The self-action help group had a statistically significantly higher change of 12.6 percentage points of gaining a temporal contract and a statistically significant 7.4 percentage points increase in having a permanent contract.

Additionally, Verlaat et al. (2020) note the extra help action group shows a statistically significant effect percentage points of gaining employment for lower educated recipients working more than 12 hours. Verlaat et al. (2020) note this effect is 9.5 percentage points higher than the control group and self-action group. Verlaat et al. (2020) argue that the extra help action group has a 7.7 percentage points higher statistically significant increase in gaining an employment contract. However the increase in employment contracts did not result in significantly more permanent employment contracts for the extra help group. Furthermore, the extra help action group shows the lowest probability in gaining permanent employment for overall education level (Verlaat et al., 2020). The effect of the income support experiment appears different for medium to high educated recipients. Figure 17 shows that none of the programs have a statistically significant effect on gaining employment for recipients with medium or high levels of education. Additionally, the self-action group shows negative effects for gaining employment for medium or higher educated recipients.

Figure 17: Effect of experimental group on recipients with medium to higher levels of education in Utrecht

Blue = Self-action group Red = Extra help action group Yellow = Working pays group

Retrieved from verlaat et al. (2020)

Verlaat et al. (2020) offer two possible explanations for the disparities between lower and medium to higher-educated income support recipients in gaining employment. Verlaat et al. (2020) reason the first explanation for the disparity is that lower educated recipients typically put in more effort in gaining employment which results in more stress that reduces the effect of their effort. Policies with no strings attached like the self-help group or policies that give intensive guidance and help reduce stress and make gaining employment more effective. The second explanation Verlaat et al. (2020) reason is that medium to higher educated recipients that request income support might have more difficulties in gaining employment compared to low educated unemployed. As such, any method of service delivery or social work cannot effectively address the difficulty in gaining employment of medium to higher educated unemployed.

During the experiment the effect on social trust and well-being of the recipients was monitored. Sanders et al. (2020) argue that more intensive social work improves social trust in the recipients. Sanders et al. (2020) note that overall the social trust improved in most experimental groups but the improvements were not statistically significant. However, Sanders et al. (2020) note that the social trust in Nijmegen decreased for both the self-help group and the extra help action group. Similarly, the social trust decreased in Deventer for the extra help action group. Although the decreases in social trust in both Nijmegen and Deventer are not statistically significant. Sanders et al. (2020) tell the experiment in Groningen improved the social trust significantly for the extra help action group. All changes in well-being were statically insignificant. Still, the (Sanders et al., 2020).

The differences across experiments are difficult to compare. De Boer et al. (2020) argue that the different effect in similar experiment groups across different cities might not be because of the experiment but because of local economic developments. Furthermore, Sanders et al. (2020) argue that comparisons between experiments are made more difficult due to the execution of the income assistant policies being localized on a municipal level. The localization of income support policies resulted in differences in operationalization between the municipalities.

To summarize, the ‘‘Weten wat werkt’’ experiment tested different forms of income support policy. Among those forms were experimental groups that mimicked basic income in the non-committedness and the ability to earn income while receiving benefits. The different forms of service delivery from the different experimental groups produced different results. Both the extra help action group that offers intensive guidance and the self-help group show greater but statistically insignificant increases of recipients gaining employment to cover 70% of the minimum wage income. The extra help action group and financial incentive working pays group showed greater increases in hours worked but the result is also statistically insignificant. The recipients in the self-help group gained stable permanent employment more often compared to other groups. The increase in more stable permanent employment for the self-help group was statistically significant when tested at the 11-month mark but not at the end of the experiment. However, when comparing all experiments across all cities, the only statistically significant results were negative effects. The statistically significant negative effects measured an average decrease in the likelihood of gaining employment of 23.7% for Nijmegen and 15.9% for Tilburg in both the self-help group and the extra help action group. The experiment in the cities of Utrecht and Zeist shows increases in employment gain. The increase in employment gain is carried by lower educated income support recipients. The increases in employment gained for lower educated recipients are statistically significant but the effect for medium to higher educated are not significant and might be negative. The non-committedness self-help group in the Utrecht experiment saw a statistically significant increase in the probability to gain employment in the metrics of money earned, more hours worked and more stable employment. Contrary to this, the intensive social work extra help action group in the Utrecht experiment only saw a statistically significant increase in the employment in the metric of hours worked. Based on interviews, recipients receiving income with no strings attached in the self-help group tend to be more critical in job searching. The recipients of the self-help group have a higher bargaining power but take longer to find employment. However, the employment for recipients in the self-help group is more often stable permanent employment. Although data trends indicate the increase in stable employment is statistically insignificant. Lastly, data shows social trust was increased with the largest increase in social trust happening in the experimental groups that had more interactions with social workers. However, the overall results for social trust were insignificant.

Finland – Kela experiment (2017-2018)

From January 1, 2017 to December 31, 2018, the Finnish government held an experiment where 2,000 unemployed people that requested unemployment benefits would randomly be assigned to receive UBI instead of unemployment benefits (Kela, 2021). Kela (2021) tells the selected unemployed would receive a monthly income via UBI of 560 euro (635 USD). Participants would be allowed to keep the income from the UBI if they would gain employment. The experiment guaranteed income but only for 2,000 randomly selected claimants of unemployment benefits. As such the guaranteed income was not universal. The experiment made use of a control group to verify the result of the research (Kela, 2021).

The aim of the basic income experiment was to test if basic income would allow unemployed to gain employment faster. Young (2020) tells the idea of basic income was that recipients would accept work sooner, even if the work paid a lower salary or was temporary work. The acceptance of work was incentivized by the fact that employed recipients of basic income would keep their basic income as opposed to unemployment benefits. However, Young (2020) notes that the results show receiving basic income does not impact the likelihood of recipients entering into the workforce. As shown by the results of the first year of the experiment. The test and control group both worked an average of 49 days of the year in the first year of the experiment (Young, 2020).

The researchers observed differences between the test and control group. Kangas, Jauhiainen, Simanainen and Ylikännö (2019) tell test and control groups were made-up of the unemployed that had partial employment. Of the test group 184 people (or 31% of people) had partial employment while receiving UBI. With 71 out of 184 (38%) of UBI recipients having part-time employment. Of the control group 261 people (or 25%) had partial employment while receiving unemployment benefits. With 79 out of 261 (25%) of unemployment benefit recipients in the control group having part-time employment. Kangas et al. (2019) argue people with part-time employment that receive basic income reported the wish to gain full-employment at a higher rate of 69% compared to the control group. Of recipients in the control group that received unemployment benefits and working part-time only 58% of recipients reported the wish to gain full-time employment.

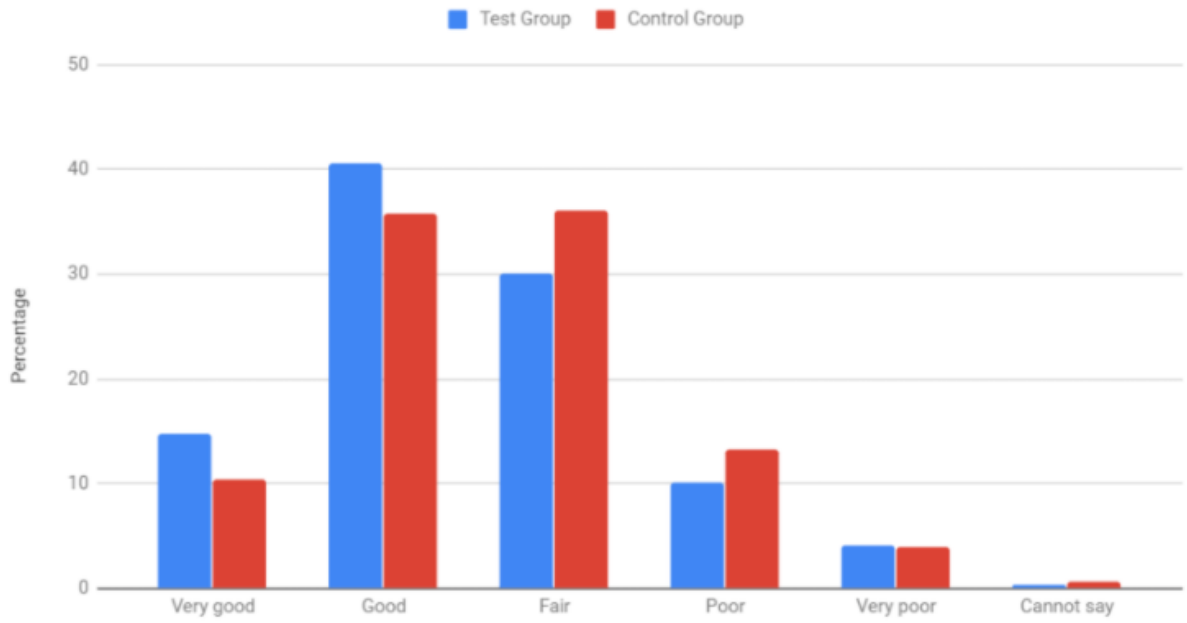
Recipients of basic income are more optimistic about the change of gaining employment.

Furthermore, Kangas et al. (2019) notes that 56% of people receiving basic income thought at a significantly higher rate compared to the people in the control group that they would be able to find employment within a year. For comparison, of the control group 45% of unemployment benefit recipients thought they would be able to find employment within a year. Both basic income recipients and the unemployment benefit recipients in the control group agree that receiving basic income would make accepting job offers more likely or that receiving basic income would make it easier to start their own business compared to receiving unemployment benefits (Kangas et al., 2019).

The experiment showed no significant difference in the chance of gaining employment between basic income recipients or unemployment benefit recipients (Kangas et al., 2019). Kangas et al. (2019) note recipients reported statistically significant differences between the basic income group and control group other than employment gain. However, the research did not focus on what activities (e.g. more volunteer work) the group receiving basic income did in comparison to the control group (Prochazka, 2019). Additionally, the experiment did show an insignificant 1% increase in the chance of basic income recipients becoming entrepreneurs (Sexton, 2019).

A difference in perceived health between the test and control group was measured by the researchers. The survey results of how the respondents perceived their health is shown in figure 18. Kangas et al. (2019) argue that the results show that the group receiving basic income perceives their health as better compared to the control group. With 54.8% of the basic income group rating their health as ''good'' or ''very good'' compared to 46.2% of the control group. Additionally, Kangas et al. (2019) note other aspects were also reported higher in the group receiving basic income compared to the control group, such as the ability to concentrate. With 66.7% of the basic income group reporting a ''good'' to ''very good'' ability to concentrate compared to 55.7% of the control group (Kangas et al., 2019). Kangas et al. (2019) tell that the research measured the state of mind of recipients with a survey question about if the recipients had lost interest in things which were previously considered enjoyable. Kangas et al. (2019) argue nearly one-third (33.8%) of the control group had experienced a negative state of mind of losing interest in previously enjoyable things compared to nearly a quarter (24.7%) of the group that received basic income.

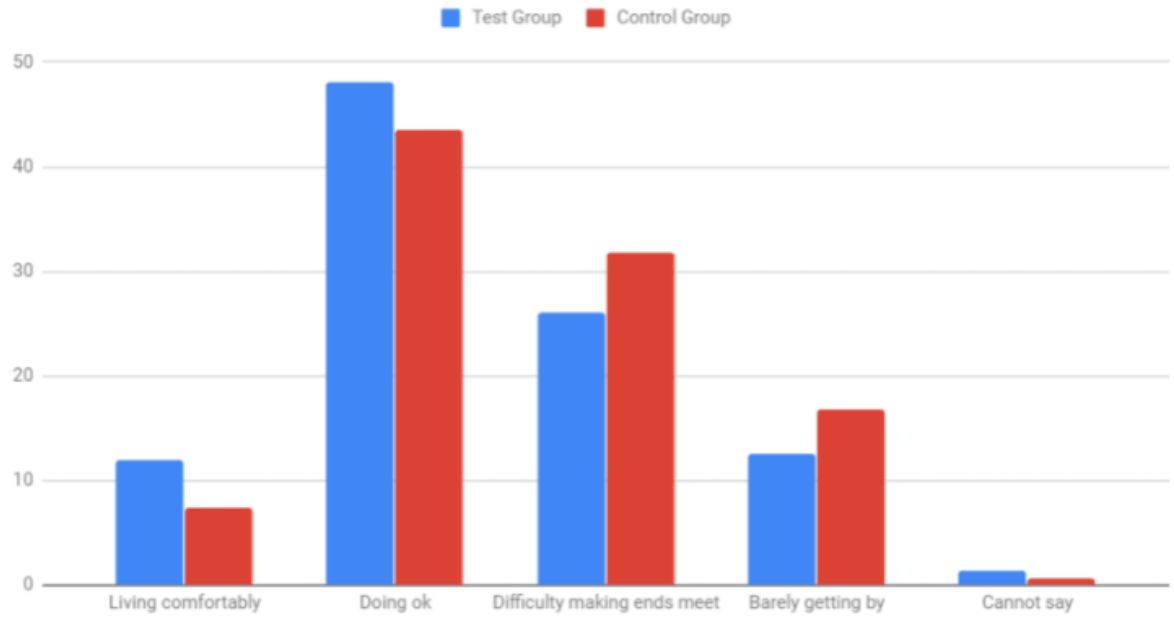
Figure 18: Survey results perceived health



Retrieved from Charlton (2019)

The basic income group reports better financial well-being. The survey results considering financial well-being during the experiment are shown in figure 19. Kangas et al. (2019) find that the group receiving basic income reported at a higher rate that their financial status was ''living comfortably'' at 11.9% compared to 7.4% of the control group. Likewise, the group receiving basic income reported at a higher rate of 48.1% compared to 43.5% of the control group that the status of their financial well-being was ‘’ok’’. Furthermore, Kangas et al. (2019) argue people receiving basic income reported lower rates of difficult financial situations. Kangas et al. (2019) found that recipients of basic income were less likely to answer they had ''difficulty making ends meet'' at a rate of 26.1% compared to 31.8% of the control group. Additionally, people receiving basic income reported lower rates of being ''Barely able to get by'' at 12.5% compared to 16.8% of the control group (Kangas et al., 2019).

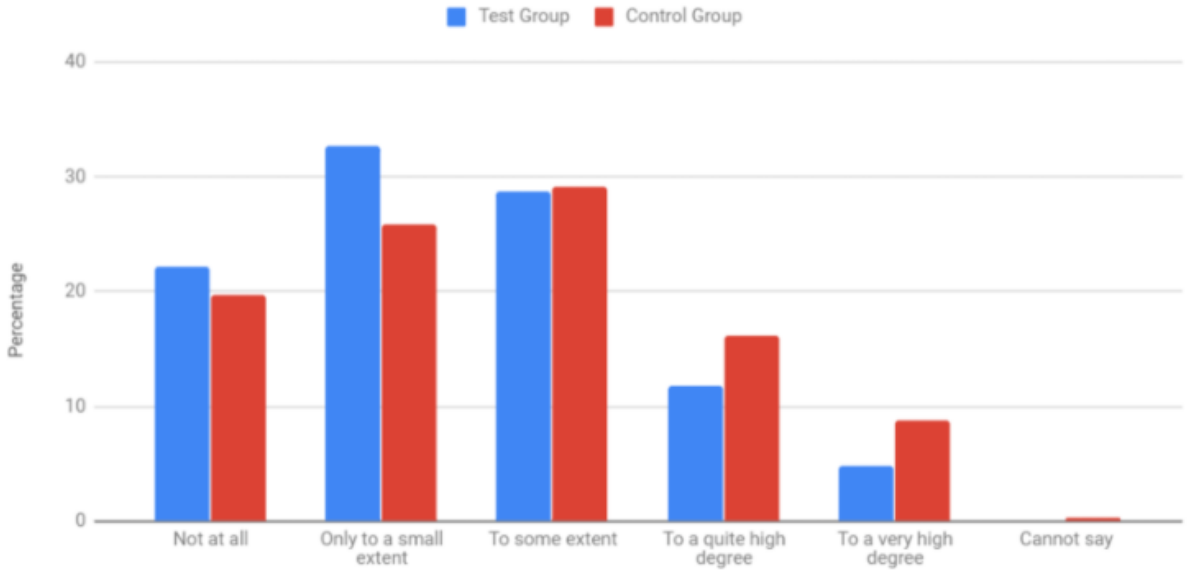
Figure 19: Survey results financial well-being



Retrieved from Charlton (2019)

Higher rates of economic stress have been observed to have a significant health impact. With long-term stress having an extensive effect on both well-being and ability to function. The results of both test and control group concerning stress levels during the experiment are shown in figure 20. Kangas et al. (2019) argue that the group receiving basic income reported a statistically significant lower rates of stress compared to the control group. Kangas et al. (2019) argue the stress rates of basic income recipients are lower compared to the stress rates of the control group that received unemployment benefits. Kangas et al. (2019) note that 22.2% of basic income recipients reported no stress at all, 32.6% of basic income recipients reporting a small amount of stress, 28.7% of the basic income group reporting they felt stress to some extent, 11.8% of basic income recipients reporting stress to quite a high degree and 4.8% of recipients of basic income reporting a very high degree of stress. Kangas et al. (2019) note the control group receiving unemployment benefits had higher levels of stress compared to the basic income group. With 19.7% of the control group reporting no stress at all, 25.9% of the control group reporting a small amount of stress, 29.1% of the control group reporting stress to some extent, 16.2% of the control group reporting stress to quite a high degree, and 8.8% of the control group reporting a very high degree of stress. The results show higher rates of more stress in the control group compared to the test group that received basic income (Kangas et al., 2019).

Figure 20: Survey results stress amount



Retrieved from Charlton (2019)

The group receiving basic income had an increase in social trust. Kela (2019) tells that respondents of both the test and control group reported their social trust during the experiment on a scale of 0 to 10 (0 meaning do not trust and 10 meaning completely trusted). Kela (2019) argues basic income recipients had higher social trust compared to the control group receiving unemployment benefits. Kela (2019) noted that the group receiving basic income reported an average social trust score of 6.8 compared to the lower average reported score of 6.3 of the control group. Similarly, Kela (2019) notes recipients of basic income report an average higher trust score for politicians of 4.5 compared to the 4.0 average score of the control group. Likewise, trust in the court system is reported to be higher for the group receiving basic income with an average score of 7.2 compared to the lower average score of 6.9 for the control group (Kela, 2019).

The finding that the experiment made participants happier is a discussion point for critics and UBI advocates. Matthews (2017b) notes that the policy of UBI holds different aspirations from different interests. Examples of different interests could be welfare state reforms, motivating employment, solution for technical unemployment or ending suffering for humanitarians (Matthews, 2017b). While Samuel (2019) writes *''Finland gave people free money. It didn't help them get jobs — but does that matter?''*(Title). Samuel (2019) notes that improving the human condition by creating happiness is also a positive result. Sexton (2019) views the UBI experiment as a failure for not reducing unemployment. Sexton (2019) argues that if reducing stress is the main benefit from a UBI policy that this singular benefit should invalidate UBI to be rolled out as a policy nationwide due to the high associated costs with such a nationwide program.

Basic income reduces perceived bureaucratic experiences (red tape). Kangas et al. (2019) argue that basic income has more payment stability and fewer means-tests for the recipients compared to unemployment benefits. For example, the unemployment benefits are typically claimed retroactively and unemployment insurance can have eligibility criteria that must continuously be met like job searching. Kangas et al. (2019) note respondents reported a statistically significant difference between basic income group and control group to the question if respondents thought that claiming their respective income policies involved too much bureaucracy. 67.9% of the control group receiving unemployment benefits answered they experienced too much bureaucracy. The basic income group

experienced less bureaucracy compared to the control group. With 58.9% of the basic income group recipients responded they experience too much bureaucracy (Kangas et al., 2019). The clear majority of both groups still responded they experienced too much bureaucracy. Kangas et al. (2019) note that, while the basic income group receives basic income for unemployment the recipients still receive other forms of welfare like rental assistance. Kangas et al. (2019) argue that the recipients of the basic income group would answer that they experience too much bureaucracy based on experienced bureaucracy of other welfare programs and not basic income. A Kangas et al. (2019) note a 9% difference between groups shows some effect of the basic income on reducing bureaucracy. Furthermore, Kangas et al. (2019) point out that a large majority of respondents agrees that basic income would reduce bureaucracy when accepting a job offer. With 81% of the basic income group agreeing (somewhat or strongly) and 72% of the control group agreeing (somewhat or strongly) that basic income would reduce bureaucracy when accepting a job. The reduction of experienced bureaucracy was also linked to the reduction of stress in the test group (Kangas et al., 2019).

Kangas et al. (2019) argue that the overall results of the basic income experiment did not show a significant positive effect on gaining employment. However, Kangas et al. (2019) note that a basic income also did not show a significant difference in gaining employment compared to the current unemployment benefits policy. Santes (2019) argues that the result of the basic income experiment raises questions for the effectiveness of conditionality and reciprocity for decreasing unemployment in current welfare policies. As the overall effectiveness of basic income policies was found to be similar to current welfare policies (Santes, 2019). Prochazka (2019) takes a different approach by raising the question for the efficacy of unemployment benefit policies in welfare systems and UBI policies in reducing unemployment. The question may not be if the policies are as efficient but if the policies are effective at gaining employment (Prochazka, 2019).

In summary, the experiment did not provide evidence that a basic income helps reduce unemployment. No statistically significant difference was found between unemployment insurance and basic income to gain new employment. However, the experiment found that people receiving basic income compared to unemployment benefits have statistically significant mental health benefits, increased societal trust and experience less bureaucracy. Furthermore, people that receive basic income were more likely to make ends meet compared to unemployment benefits. Disparity exists if the results of the experiment show the ineffectiveness of UBI or current welfare bureaucracy or that these findings show alternative application for a UBI policy.

Korea – Gyeonggi province (2019-2022)

The governor of Gyeonggi province in the Republic of Korea (the province surrounding the capital of Seoul) introduced a Youth Basic Income (YBI). For years the governor tried to implement an unconditional basic income however these efforts were without success (Franzmann, 2021). BIEN (2019) tells that in the office of mayor in 2016 the current governor of Gyeonggi province introduced a similar city-wide YBI program for 10,000 24-year-old residents with the same pay-out as the later province-wide YBI program. The then-mayor received criticism during the city-wide YBI program from the national government by calling it populist. However, the city-wide YBI program gained strong support from the local business people and youth (BIEN, 2019). The YBI is paid with the conception to help fill the gap between someone completing their education and getting their first job (Franzmann, 2021). Moreover, Yoo et al. (2020) notes the current young generation faces several challenges like being the first generation that will be economically worse off than the previous generation, labor insecurities, extreme inequality, and competition in every aspect of life. Unrest under the current young generation has resulted in several youth protests. (Yoo et al., 2020).

In April 2019 the YBI started paying out 250,000 Korean Republic Won (KRW) (or about 220 USD) worth in the local community currency on a quarterly basis. The experiment will run for four years until 2022 (Yoo et al., 2020). Yoo et al. (2020) analyzed and published the data and results from the first year of the experiment. The YBI is not a direct cash transfer. However, the local currency functions much like a debit card and is widely accepted in the local community. Yoo et al. (2020) note the policy has been described as a ''near-cash payment'' by the basic income earth network (BIEN). The 24-year-old recipients are paid a total of 1,000,000 KRW (worth around 900 USD) for the year the recipients are 24 years old. Comparatively, the basic expenses of a one-person household are 512,102 KRW per month. For the year 2019, approximately 175.000 24-year-olds were eligible in Gyeonggi province. Which makes the overall cost approximately 175 billion KRW or about 147 million USD. (Lee, Lee & Kim, 2020; Yoo et al., 2020).

For eligibility the 24-year-old needs to live in Gyeonggi province and have lived in the province for 3 consecutive years or the claimant has to have lived in the province for over 10 years. The funding for the project is split between Gyeonggi province paying 70% of the YBI, and the remaining 30% are paid by the lower administrations of City and County. Overall the YBI policy is estimated to pay out 1,000,000 KRW to 686,500 eligible residents over the 4-year lifespan of the program (Yoo et al.,2020).

Data was collected by surveys. Yoo et al. (2020) note the data was collected using pre-and-post-YBI surveys with 11,335 respondents. Additionally a control group of 800 respondents from outside the Gyeonggi province is used. Gyeonggi Research Institute analyzed variables of several categories using paired and independent t-tests (Yoo et al., 2020).

Recipients of YBI increase their economic activity but not by a statistically significant margin. Yoo et al. (2020) argue that youth receiving the YBI were more active in job searches. The group receiving the YBI searched more hours although the difference is not statistically significant. Yoo et al. (2020) note the YBI policy only limitedly influenced the effect on the job training the recipients received. However, the increase in job training was statistically insignificant. Moreover, Yoo et al. (2020) argue that youth receiving the YBI for 3 quarters increased their weekly hours worked by an average of 1 hour per week while youth not receiving the YBI retained similar working hours. The difference in working hours between YBI recipients and the control group was not statistically significant (Yoo et al., 2020).

Recipients of the YBI policy reported improved happiness. Yoo et al. (2020) argue that the happiness of recipients was improved significantly in several metrics. Recipients of YBI reported a significantly higher overall life satisfaction rate with an average rating 6.26 out of 10 compared to the 5.68 average of the control group. Recipients of YBI reported a significantly higher overall life satisfaction rate with an average rating of 6.26 out of 10 compared to the 5.68 average rating of the control group. The YBI recipients reported a significantly higher value of the work they did as the recipients reported an average score of 6.29 out of 10 compared to the average score of 5.72 of the control group (Yoo et al., 2020). Additionally, Yoo et al. (2020) argue that YBI recipients felt happier as recipients reported a significantly higher average rating of happiness of 6.23 out of 10 compared to the average score of 5.90 of the control group. The recipient group also reported lower scores for negative emotions. As YBI recipients reported an average score of 4.11 out of 10 for levels of depression and 5.21 out of 10 for worry. The negative emotion scores of the recipients are significantly lower than the respective scores of the control group at an average score of 4.57 for depression and an average score of 5.43 for worry (Yoo et al., 2020). Yoo et al. (2020) note that the recipients reported no significant difference in the degree of mental health difficulties compared to the control group. Furthermore, comparing the differences prior to and post the YBI pay-out Yoo et al. (2020) find that overall happiness went down during the first year of the experiment.

YBI recipients have better health and dietary habits. Yoo et al. (2020) argues that recipients of YBI report several factors of better health and healthier behavior. YBI recipients report significantly higher health scores based on self-evaluated health and self-evaluated health compared to peers. YBI recipients rate their self-evaluated health with an average score of 3.20 out of 5 which is significantly higher compared to the average score of the control group at 3.07. Likewise, YBI recipients rate their self-evaluated health compared to peers with an average score of 3.12 out of 5 which is significantly higher compared to the average score of the control group at 2.96. Additionally, Yoo et al. (2020) argue that recipients report improved cognitive function as recipients answered they forgot important things significantly less often. YBI recipients rated their cognitive function significantly higher on average with a score of 1.99 out of 5 compared to the average score of 2.09 of the control group. Yoo et al. (2020) argue YBI recipients also have healthier behavior compared to the control group. The survey showed that YBI recipients did significantly more 30-minute workouts than prior to receiving the YBI payout. Furthermore, the recipients started significantly more diets than prior to receiving the YBI. Moreover, Yoo et al. (2020) argue recipients of the YBI take greater effort to eat healthier as recipients report a significantly larger average score of 3.29 out of 5 compared to 3.19 prior to the YBI payments. Yoo et al. (2020) note that while receiving YBI payments recipients started to eat healthier foods more often. The survey showed that fruit consumption of the recipients increased significantly from an average score of 2.13 out of 5 prior to the YBI payments to 2.17 after the YBI payments. However, this increase in fruit consumption was insignificant compared to the control group (Yoo et al., 2020).

The attitudes and perceptions of YBI recipients towards societal elements were affected by the policy. Yoo et al. (2020) argue that the YBI payments created a greater degree of trust towards others. The YBI recipients had a statistically significant higher level of trust in laws and institutions after receiving YBI. Trust in laws and institutions rose on average from a 3.05 to 3.13 out of a 5 point score. Notably, the average of the control group saw a decrease in trust in laws and institutions during the same period. Yoo et al. (2020) reason the increase in interest for laws and institutions are due to the YBI payments from the government increasing the recipients their interest in government. Moreover, Yoo et al. (2020) note that trust in politicians was reported lower than trust in other people by the YBI recipients. However, the trust in politicians did increase by a statistically significant amount for the recipients of YBI. Trust in politicians increased from an average score of 2.18 out of 5 to 2.23 after the YBI payments. Some specific categories of trust were not affected by YBI payments.

Examples being that the trust in other people or trust in the media did not see a statistically significant increase (Yoo et al., 2020).

YBI recipients were more involved with the local community and its success. Lee et al. (2020) argues that more than 80% of respondents answered they use the local currency conveniently and expressed overall satisfaction with the local currency. Lee et al. (2020) note most local currencies in Gyeonggi take a digital form like debit cards and are generally regarded as equivalent to in-cash payments. Locals say payments in local currencies have nurtured a virtuous cycle structure within the welfare state and local economy. The local currency can only be used in the area where the resident lives and the local currency is only accepted at Small and Medium Enterprises (SME). The local limitation of the currency is to offset the regional economic imbalance. The local SME are expected to increase their sales instead of sales going to larger companies (Lee et al., 2020). Lee et al. (2020) note that usage of the local currency is incentivized by giving a 6% discount when the currency is used for a payment. Lee, Yoo and Kang as cited in Lee et al. (2020) argue that in an evaluation of August 2020 that 85.6% of the YBI paid out in the local currency was used in the local economy. As of September 2019, 5 months after the program started, the produced induced effect of the local currency equaled 490,1 billion KRW. Additionally, the value-added inducement was worth 204,4 billion KRW. Furthermore, the employment inducement effect had created 2591 jobs (Lee, Yoo and Kang, as cited in Lee et al., 2020). Moreover, Lee et al. (2020) note that the respondents indicated that they are more interested in revitalizing the local economy and fostering local communities. However, Lee et al., (2020) argues the sustainability of the local currency is uncertain. As the long-term success of the local currency is dependent on the complementary goals of the government of the Gyeonggi province. For a local currency to be sustainable it must establish a strong cooperative relationship between companies and cooperatives (Lee et al., 2020).

The societal perception changed for the recipients of YBI payments. Yoo et al. (2020) argue that the recipients of YBI payments had improved views of gender equality in Korean society. The recipients reported a statistically significant increase in the average score from 2.43 to 2.49 out of a 5 point score to the question of whether the recipients lived in a gender equal society. However, Yoo et al. (2020) note the recipients their view of equality in the Korean society as a whole did not change significantly. Furthermore, Yoo et al. (2020) argue YBI recipients felt significantly more responsible for the social problems in their society. However, Yoo et al. (2020) argue the recipients were also significantly less supportive of policies like universal welfare, universal education, or universal healthcare but YBI recipients favored an increase in taxation. Recipients reported a more positive attitude towards basic income as a universal right than the control group. Furthermore, Yoo et al. (2020) argue that the support of basic income as a right increased by a statistically significant margin for the recipients of YBI. However, Yoo et al. (2020) note the support to introduce the Youth Basic Income nationwide dropped in support with both the test group and the control group after the YBI payments. Yoo et al. (2020) note that the rate of support for YBI as a nation-wide policy was higher before and after the transfers in the YBI recipient group. However, the support for a nation-wide YBI policy decreased at a higher and statistically significant rate for the YBI recipients group compared to the control group.

Recipients of YBI payments reported experiencing greater autonomy. Yoo et al. (2020) argue that YBI recipients reported a statistically significant greater degree of self-determination. The average self-determination score of YBI recipients increased by a statistically significant margin from 4.24 out of 5 before the YBI payments to 4.29 after the YBI payments. Similarly, Yoo et al. (2020) argue that recipients thought they had a greater influence on others in decision-making processes. The difference in the reported influence on decision-making processes increased by a statistically significant rate from an average of 3.55 out of 5 prior to the YBI payments to 3.59 after the YBI payments (Yoo et al., 2020).

Receiving a YBI transfer makes recipients more hopeful about their future and personal finance. Yoo et al. (2020) argue recipients were significantly more optimistic about imagining the future. As recipients reported an increased average score with regards to their future personal finance from 4.21 on a seven-point scale prior to receiving YBI transfers to 4.36 after receiving the YBI transfers. Recipients could also imagine themselves being more successful in the future as the reported average score increased with a significant margin from 4.70 out of seven before the YBI payments to 4.79 after the YBI payments. Likewise, Yoo et al. (2020) argue recipients became significantly more hopeful about the future with an increase in the average score from 4.59 out of seven prior to the YBI payment to 4.64 after the YBI payments. Moreover, recipients report they think their future will be better than their present condition at a significantly higher rate. Recipients reported a significant increase in the average score regarding their future from 5.05 out of seven to 5.10. Also, Yoo et al. (2020) note recipients express they are significantly more hopeful they can achieve their dreams in life. With the average of recipients believing they can achieve their dreams increasing from 4.53 to 4.60. Recipients also reported they believed at a significantly higher rate that they could face the troubles of life. With the average score increasing significantly from 4.49 out of seven prior to the YBI payments to 4.56 after the YBI payments. Yoo et al. (2020) argue YBI made the recipients more optimistic due to YBI recipients being significantly more likely to report that they feel they can overcome any obstacle. As the average score significantly increased from 4.42 out of seven before the YBI payments to 4.69 after the YBI payments.

However, while the YBI recipients were significantly more hopeful the metrics measuring despair of YBI recipients also increased significantly. Yoo et al. (2020) argue recipients felt significantly more hopeless about the future. With the reported average score of hopelessness about the future of YBI recipients increasing significantly from 4.58 out of seven before the YBI payments to 4.65 after the YBI payments. Likewise, nervousness increased significantly in recipients. As recipients reported an significant increase in the average nervousness score from 3.95 out of seven before the YBI payments to 4.05 after the YBI payments (Yoo et al. 2020).

Recipients of YBI payments found that they had more time available for certain activities. Yoo et al. (2020) argue that recipients spend significantly more time eating when examining the average time prior and post the YBI payments. Furthermore, Yoo et al. (2020) note that the recipients significantly increased the time spent on housework. The significant increase in time spent on housework was in contrast to the significant decrease in time spent on housework by the control group. Recipients of YBI spend significantly more time with their families compared to before receiving YBI. Likewise, Yoo et al. (2020) argue recipients also spend significantly more time doing civic activities and volunteering. Additionally, Yoo et al. (2020) argue recipients spend significantly more time on self-development activities such as workouts or study. However, Yoo et al. (2020) note that YBI recipients reported they also spent more time on leisure activities.

Youth basic income payments affected YBI recipients their spending for certain expenditures. Yoo et al. (2020) note that it is commonly suggested that direct transfers increase spending. However, Yoo et al. (2020) argue that the overall spending on food decreased significantly by an average of around 12,000 KRW per month during the period the YBI was paid out. Although, Yoo et al. (2020) note spending on housing did significantly increase with an average of around 14,000 KRW per month for both the recipients and the control group. However, the spending on housing increased comparatively more for the control group outside of Gyeonggi province. Furthermore, Yoo et al. (2020) note spending on education and self-development increased significantly with an average of about 20,000 KRW per month. Moreover, Yoo et al. (2020) note spending on education and self-improvement decreased for the control groups during this period with a similar average of 20,000 KRW per month. Finally, the change in time spent on leisure activities increased significantly for the YBI recipients. YBI recipients did not significantly spend more

on leisure activities when compared to the control group.

To summarize, The Youth Basic (YBI) income of Gyeonggi province pays 24-years-olds in a local currency with the aim of helping the recipient its adult life off to a swift start. Recipients of the YBI reported numerous benefits. Recipients increased the hours worked per week. Recipients reported they felt happier. Likewise recipients reported they experienced a higher life and work satisfaction and experienced less negative emotions. Recipients self-evaluated they were in better health compared to their prior self or their peers after receiving the YBI payments. Similarly, recipients reported they had improved cognitive functions compared to before the YBI payments. Recipients made a greater effort to live healthier by doing more workouts, dieting more often and eating healthier such as by consuming more fruits. Recipients had a greater deal of trust in the laws and institutions and greater overall trust. Recipients were more involved with their local communities and wanted to improve their communities more often. Recipients spent more money in the local community which created more jobs. Recipients changed their view of society. YBI recipients viewed society as more gender-equal and viewed themself as more responsible for social issues. Recipients favored increases in taxes and were increasingly likely to support basic income. However, YBI recipients their support for social policies other than basic income decreased. YBI payments increased spending on housing for both YBI recipients and the control group. YBI recipients decreased spending on food. Moreover, YBI recipients increased spending on education and self-development. While the spending of the control group on education and self-development decreased.

Iran – Unintended UBI (2011-2016)

In the fall of 2010 the Iranian government announced a change to decade-long subsidies on food and fuel. The subsidies on fuel disproportionately benefited the wealthier citizens. With 70% of the fuel subsidies being received by the wealthiest 30% of citizens. The subsidy policy reform would make fuel and food products more expensive (Van der Borght, 2010). A basic income policy was designed by the Iranian government to cushion the blow of the price increases on fuel and food (Widerquist, 2012). Attari and Van Dijk (2016) tell that the universal cash transfer was planned to be gradually phased out over five years. At first, the proposed policy was to have means-tested payments to promote social justice. However, Attari and Van Dijk (2016) note the means-tested idea for the transfer policy changed after an income survey among 17 million households turned into a fiasco. Attari and Van Dijk (2016) argue this fiasco changed the policy design to a policy that would pay out an equal monetary sum for all who registered. Attari and Van Dijk (2016) note the unconditional basic income of 810,000 rails (worth about 80 USD) would be paid to the bank account of a citizen that registered for the policy every two months. This payment system was later changed to pay 405,000 rails per month (Attari & Van Dijk, 2016). The transfer was paid to the heads of all households (McFarland, 2016). For a family of five the basic income of around 200 USD would provide the equivalent income of one-third of a minimum wage job (Van der Borght, 2010). On a per-capita basis, the unconditional cash transfer is the equivalent of 28% of the median income (Salehi-Isfahani & Mostafavi-Dehzooei, 2018). Regardless, the policy was not seen as a basic income but was regarded as compensation for the food and fuel subsidy it replaced (Van der Borght, 2010).

Sources differ on the initial popularity of the UBI program. Van der Borght (2010) argues initially around 60,5 million Iranian citizens (81% of the population) would request unconditional basic income. Heyrani (2020) argues that initially 65% of Iranians would request the universal cash transfer. Gentilini et al. (2021) argue that at the height of the program the unconditional basic income transfer covered 97% of the 72,5 million people of the Iranian population.

Data of the early stage of the policy shows an alleviation of poverty. Salehi-Isfahani, Stucki and Deutschmann (2015) argue based on survey data from the first 3 months after the transfer policy payouts that the unconditional cash transfer reduced poverty. The program saw proportionately more participation from rural families that had less access to banks. However, the poorest and the richest 10% of the Iranian population registered the least for the unconditional cash transfers. Enami and Lustig (2018) argue that during the early stages of the unconditional cash transfer scheme the poverty headcount ratio was reduced from 22.5% to 10.6% of the population. However, data from Trading Economics (n.d.b) show the reduction in poverty was not durable. Annual double digit inflation is common for Iran during the period of the transfer. The high inflation severely eroded the real value of the transfer (Trading Economics, n.d.b). Enami and Lustig (2018) tell that Iran saw an estimated 136.5% of inflation in the five years following the start of the universal cash transfer policy. This inflation decreased the poverty-reducing effect by 40% which increased the poverty headcount rate by about 5 percentage points. The effects of high inflation were larger in rural areas than in urban areas (Enami & Lustig, 2018).

The manner in which unconditional cash transfers affected spending differs based on characteristics. Heyrani (2020) argued the unconditional cash transfer had a significant effect on nutrition via increasing food security in urban areas with increased intake of calories and protein. Heyrani (2020) noted that urban households used a significantly larger percentage of their household fund on food than in years prior to the universal basic cash transfer. Moreover, rural households significantly decreased spending on entertainment (Heyrani, 2020). Mostafavi-Dehzooei, Salehi-Isfahani and Hehmatpour (2020) argue similar spending effects of the unconditional cash transfer as

Heyrani (2020). The approach of Mostafavi-Dehzooei et al. (2020) differs in that the research focused on the poor by using the ratio of income that the unconditional cash transfer was from the total income. Mostafavi-Dehzooei et al. (2020) find that poorer Iranian recipients did spend more money on food. The food bought by poorer Iranians was often healthier with increased intake of proteins and vitamins. Additionally, Mostafavi-Dehzooei et al. (2020) argue the ratio approach shows the effects of high inflation reduced the buying power of poorer Iranians over time. The reduction in buying power can perhaps also be seen in the reduction of water usage. Attari and Van Dijk (2016) argue that unconditional cash transfer decreased the water usage nationwide by 5%. The reduction of water usage was particularly noticeable in the suburbs where predominantly poorer residents reside (Attari and Van Dijk, 2016).

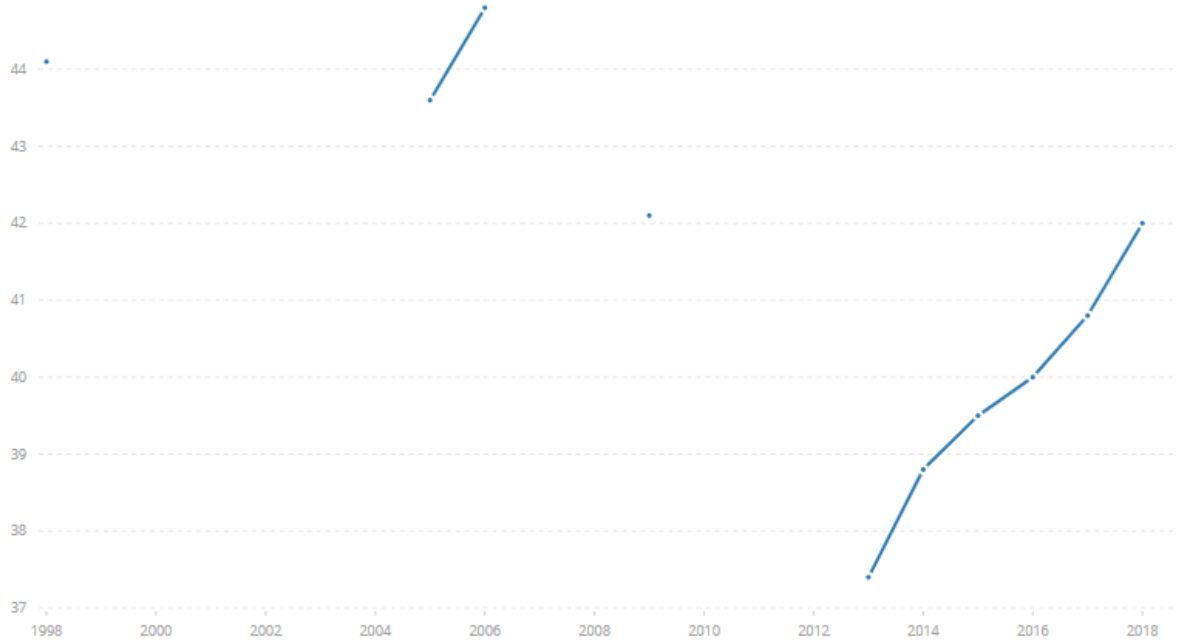
The unconditional cash transfer did not impact the willingness to work of recipients. Salehi-Isfahani and Mostafavi-Dehzooei (2018) argue that the unconditional cash transfers did not lower the labor supply in terms of hours worked or labor participation. On the contrary, Salehi-Isfahani and Mostafavi-Dehzooei (2018) argue self-employed workers increased their labor. Salehi-Isfahani and Mostafavi-Dehzooei (2018) reason that self-employed workers used the money from the unconditional cash transfers as an investment to expand their business. Furthermore, Salehi-Isfahani and Mostafavi-Dehzooei (2018) argue labor force participation of women increased during the unconditional cash transfers. Salehi-Isfahani and Mostafavi-Dehzooei (2018) did observe non-statistically significant reductions in labor supply in sectors with physically demanding jobs like agriculture and industry.

The unconditional cash transfers affected the fertility rates of women. Heyrani (2020) argues that the universal cash transfer increased fertility rates for women in urban and rural areas. Heyrani (2020) noted that the fertility rates increased for households with one, two or three children prior to the introduction of the transfer. Households that had no children before the introduction of the transfer had a negative fertility rate. Meaning households with no children were less likely to have their first child (Heyrani, 2020).

Financial troubles made the Universal Basic Income program difficult to sustain. McFarland (2016) tells that the Iranian government ran into a budgetary deficit within a year of the cash transfer program its start. McFarland (2016) notes that as a response to the budgetary deficit the Iranian government asked well-off citizens to voluntarily decline the cash transfers. About two-and-half million citizens began declining the transfer while 73 million other citizens retained then transfers. However, McFarland, (2016) tells that the voluntary redraws of well-off citizens proved insufficient to stop the growing budgetary deficit. McFarland (2016) argues that as a result of the budgetary deficit of the Iranian government that the government withdrew the eligibility for the direct cash transfers for 3,3 million citizens in January of 2016. Eligibility was reformed to a means-tested eligibility based on the financial situation of the claimant. Moreover, later in April 2016 the Iranian parliament approved a bill that resulted in the loss of the direct cash payments to about 24 million citizens or nearly one-third of the population (McFarland, 2016).

The universal scale of the cash transfer allows the use of national scale data about Iran. However, The World Bank (n.d.a) has limited available data of the Gini Coefficient over the runtime of the universal cash transfer. Consistent data only exists since 2013 as seen in figure 21. Prior to the universal subsidy policy of 2011 Iran had a Gini Coefficient of 42.1% in 2009. Figure 21 shows a Gini coefficient of 37.4% for Iran in 2013. However, wealth inequality returned to a similar level as before the universal cash transfer in 2018 with a Gini coefficient of 42%.

Figure 21: The World Bank estimate for Gini Coefficient Iran



Retrieved from The World Bank (n.d.a)

In conclusion, the Iranian government reformed fuel and food subsidies that predominantly benefited the wealthy citizens into a universal cash transfer program. The policy reform into a universal cash transfer policy saw a more equal access to the policy for all citizens and a reduction in poverty. The cash transfer policy saw a lower participation from the poorest and richest 10% of Iranian citizens. The cash transfer program changed the spending behavior of recipients in urban areas that increased spending on food which improved nutrition. However, the high levels of inflation eroded the real value of the unconditional transfer. The high inflation decreased the poverty-reducing effect of the unconditional cash transfer program over time. The nationwide water usage decreased by 5% which was driven by the water usage of poorer suburban neighborhoods. No significant reduction in labor supply occurred during the payout of the cash transfers. On the contrary, the labor supply of self-employed workers and women increased. Furthermore, the cash transfers affected the fertility rates of women. More children were born in households that already contained children. While households with no children remain childless more often. Income inequality may have been reduced but the reduction was only temporary.

Mongolia – Human Development Fund (2010-2012)

Mongolia is a landlocked country in eastern Asia with a population of around 2.7 million. The largest export product of Mongolia is raw minerals which make up 80% of the overall Mongolian exports (UBI Lab Leeds, 2020).

Since 2004 the Mongolian government has had a basic income policy targeted at children (UBI Lab Leeds, 2020). The universal transfer targeted at children reduced poverty (Budragchaa et al., 2007). Similarly, Gankhuyag and Banzragch (2014) argue that the cash transfers targeted at children reduced the poverty rates. The universal cash transfer targeted at children reduced poverty near the lower poverty line (20,426 MNT or18 USD per month) of the poverty headcount from 19.5% in 2002 to 8.9% in 2010. Likewise, the universal cash transfer targeted at children reduced poverty of the upper poverty line (38,471 MNT or 34 USD per month) of the poverty headcount from 53.8% in 2002 to 39.8% in 2010.(Gankhuyag & Banzragch, 2014). Gankhuyag and Banzragch (2014) note part of the reduction in poverty was based on the economic mining boom which reduced 3.2% of all poverty. The period during which the transfer targeted at children was paid out coincided with a slight reduction in income inequality. Gankhuyag and Banzragch (2014) note this reduction in inequality can be seen in the reduction of the Gini coefficient of income inequality from 38.6% in 2002 to 35.2% in 2010.

The 2008 Mongolian election was the turning point for the Mongolian UBI policy. Namkhaijanstan and Mihalyi (2020) tell that the Democratic Party (DP) and the Mongolian People's Party (MPP) were leading the polls during the 2008 Mongolian national election. Namkhaijanstan and Mihalyi (2020) note the DP promised to introduce a basic income for adults named ''The Resource Share''. The ''The Resource Share'' would grant up to 1 million Tögrögs (MNT) (around 850 USD) to each adult. Namkhaijanstan and Mihalyi (2020) tell that the MPP called the idea of a basic income economically unviable. However, the MPP later suggested its own basic income plan named ''Motherland Gift'' that would pay 1.5 million MNT (around 1,275 USD) to each citizen. Namkhaijanstan and Mihalyi (2020) describe that ambiguity surrounded the plans of both political parties. Ambiguity existed about if the plans would be a one-time transfer or an annual transfer. Likewise, ambiguity surrounded both policy proposals if the policies would be in-cash or in-kind policies. The MMP and DP formed a coalition government after the Mongolian national election (Namkhaijanstan & Mihalyi, 2020).

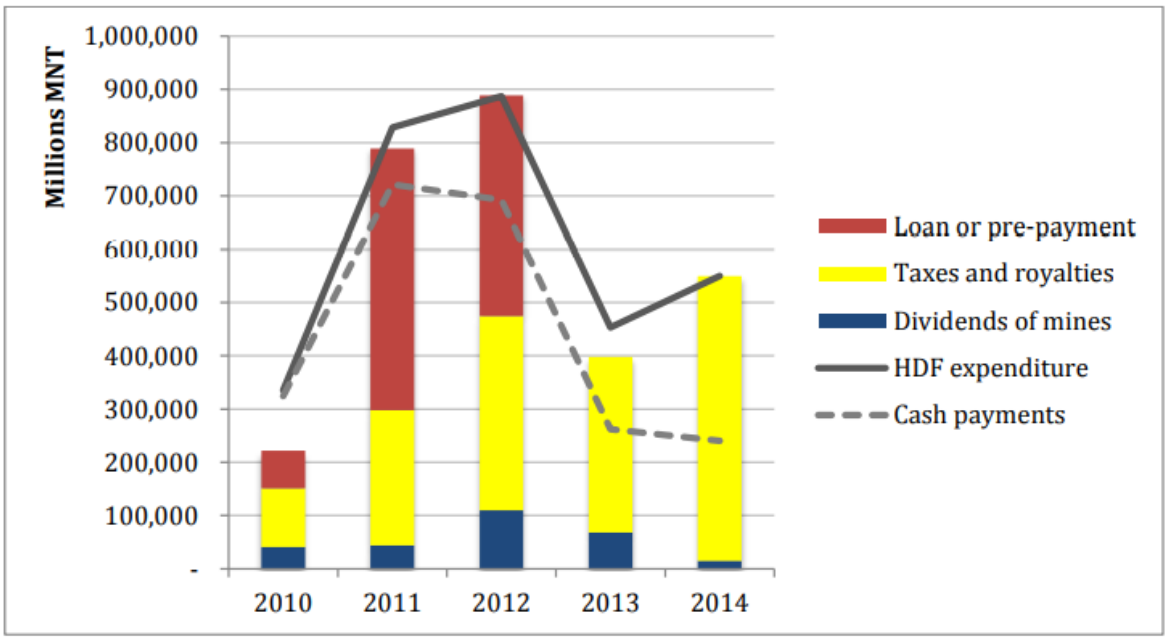
In 2009 the Human Development Fund (HDF) was established. The HDF was financed with the dividends of the state-owned mining company. The fast-growing Mongolian mining sector dissipated the economic slowdown of the Mongolian economy during the Great Recession of 2008. However, the boom in the mining sector also raised public expectations for the promised mining revenues (Namkhaijanstan & Mihalyi, 2020). UBI Lab Leeds (2020) tells the HDF provided direct cash transfers to every citizen in Mongolia from 2010 to 2012. Officially the HDF transfer policy was described as a citizen its ownership of democracy. With each citizen receiving a direct share of the country its wealth as co-owners (UBI Lab Leeds, 2020). Namkhaijanstan and Mihalyi (2020) tell that the new cash transfers of the HDF replaced the annual 120.000 MNT (around 100 USD) UBI policy targeted at children. The HDF transfers paid out a monthly UBI payment of 21.000 MNT (around 18 USD) to every adult. Over the two year runtime of the policy the HDF paid out a total of 504.000 MNT (around 430 USD) to each adult citizen. Moreover, at the end of the two year HDF transfer program each elderly citizen would receive an additional 1 million MNT (around 850 USD). The HDF transfer program was officially called ''gifts and shares'' which mimics the election promises done by both political parties (Namkhaijanstan & Mihalyi, 2020).

The Human Development Fund reduced poverty and inequality. Yeung and Howes (2015) argue that poverty was significantly reduced because of the HDF. Yeung and Howes (2015) argue this reduction of poverty based on the same methodology as used by Gankhuyag and Banzragch (2014) and Budragchaa et al. (2007). Additionally, Yeung and Howes (2015) assume that the cash transfer was fully consumed and that the cash transfer had no effect on labor supply. Yeung and Howes (2015) note that the reduction in poverty varies between years. Yeung and Howes (2015) argue poverty was reduced by a minimum of 10% or as much as one-third over the lifespan of the HDF transfer policy.

HDF payments are estimated to have significantly reduced inequality. Yeung and Howes (2015) argue that inequality measured via the Gini coefficient is estimated to be reduced by 7.6% in 2010, 13.3% in 2011 and 5.1% in 2012. However, estimates from The World bank (n.d.b) argue the Gini Coefficient for Mongolia increased over the duration of the HDF transfer policy. The World bank (n.d.b) estimates the Gini Coefficient of Mongolia at 33.1% in 2010, 33.9% for 2011 and at 33.8% in 2012.

The payments from the Human Development Fund caused budgetary problems. Yeung and Howes (2015) argue that the resources to cash scheme of the HDF were an overall failure due to the design and implementation flaws of transfer policy. Yeung and Howes (2015) note that the monetary amount of the payments of the HDF was based on election promises rather than the amount of dividend the Human Development Fund could payout. The payments the HDF paid out were not based on the dividends of mining revenue but on loans. To which extent the HDF payments were made up of which income source can be seen in figure 22. Yeung and Howes (2015) note that at some points during the HDF transfer policy the loans exceeded the mining revenue as the source of HDF payments. Yeung and Howes (2015) tell that for the year 2010 the HDF made transfers costing 324 billion MNT which was double the revenue received from the mining sector in that year. In 2011 the HDF its expenditure doubled to 800 million MNT while income from mining dividends amounted to 300 million MNT (Yeung and Howes ,2015).

Figure 22: Human Development Fund revenue and expenditures



Retrieved from Yeung and Howes (2015)

Mongolia saw a period of high inflation during the Human Development Fund transfers. Shiilegmaa, Gombosuren, Batsuuri, Lee, and Goh (2013) note that the high rate of inflation was noticed by the World Bank during the time the HDF transfers were paid out. Mongolia saw a period of two-digit inflation for the entire duration of the HDF transfer policy. The highest point of inflation was reached during 2012 at an inflation rate of 16% (Shiilegmaa et al., 2013). For comparison, Mongolia experienced its highest recorded inflation rate of 34.2% in 2008 (Trading Economics, n.d.e). The period the HDF payments were paid out did coincide with high rates of inflation. However, the inflation rates were more likely caused by the borrowing to fill the budgetary deficit and were not caused by policy characteristics of a UBI policy.

The period during which the UBI was dispersed coincided with an economic boom for Mongolia. Namkhaijanstan and Mihalyi (2020) tell that GDP was growing at an average rate of 13.7% over the years 2011 to 2013. During the period from 2011 to 2013 the Mongolian government had started borrowing money from the international capital market. Capital borrowing created a vicious cycle for Mongolia. As a result of increasing public debt Mongolia got a capital infusion worth 1.5 billion USD from bonds in 2012. This capital infusion saved Mongolia from entering a public debt crisis in 2012 (Namkhaijanstan & Mihalyi, 2020). UBI Lab Leeds (2020) notes that the HDF was reformed into the Future Heritage Fund. The Future Heritage Fund inherited the debt of the HDF and was not able to pay out a dividend for some years. However, Namkhaijanstan and Mihalyi (2020) note that regardless of the capital infusion Mongolia had entered a debt crisis in 2017. As a result of the public debt crisis the Mongolian government had to negotiate a bailout package from the International Monetary Fund (IMF). The Bailout package brought austerity measures that restricted child-related transfers to the poorest citizens (Namkhaijanstan & Mihalyi 2020). However, Namkhaijanstan and Mihalyi (2020) tell that the Future Heritage Fund restarted child-related universal transfers of 20.000 MNT in 2019. In the 2020 legislative election the ruling MPP promised to increase the child-related transfers to 100,000 MNT for a six-month period. The official reason for the increase in the child related transfers was as a response to the COVID-19 pandemic. The MPP would go on to win the election (Namkhaijanstan & Mihalyi, 2020).

Concluding, the policy expansion to cover all citizens with dividend payments initiated due to election promises. However, promises made during the election could not be paid by the current mining revenue. As such, the additional money needed for the transfers was borrowed. The payments did reduce poverty but only for a short while. The payment seemed to have no effect on income inequality.