Social Capital

The Relationship between Generosity and Human Development

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Abstract

More and more research focuses on the effects of social capital. One area of social capital that hasn't really been explored yet is generosity, which is part of one's civic engagement. Theoretically, charitable behaviour could instil more trust between parties which in turn could lead to more mutually beneficial collective actions. This would lead to higher levels of economic output and health which increase human development and hence total welfare. However, this paper shows that empirics are not completely in line with this theory. Firstly, the results show some evidence that generosity has a significant negative relation with economic output. The component of generosity that seems to cause this negative effect is donating money, whereas volunteering and helping strangers show no significant association with economic output. The hypothesis that these latter two positively influence trust does not hold up. Furthermore, as opposed to other studies, general trust is found not to have any effect on economic output at all, but it does have a significant relation with human development. Regarding health, only helping strangers seems to have a possible positive relationship with higher life expectancy, whereas donating might have a negative effect and volunteering an insignificant one. All in all, there is some evidence that generosity is positively related to human development but there also seem to be negative associations. If there are any relations at all, it is uncertain whether these are causal.

Keywords: Social Capital, Generosity, Donating, Volunteering, Helping a Stranger, Human Development, Economic Output, Health, General Trust

Table of contents

List of abbreviations

EVS	European Values Study
GDP	Gross Domestic Product
GNI	Gross National Income
HDI	Human Development Index
MBCA	Mutually beneficial collective actions
R&D	Research and development
WGI	World Giving Index

1. Introduction

Social capital is the glue that holds societies together and without which there can be no economic growth or human wellbeing. Without social capital, society at large will collapse (Krishna & Uphoff, 1999). This is because humans are social beings. Our entire lives consist of interactions and relationships with others. Our social contacts don't just give us a feeling of belonging but they also shape us (Flynn, 2008). Being social and having a broad social network are said to have many advantages for individuals and for society. All these social 'assets' together are called social capital.

Many effects of social capital have been empirically investigated. On an individual level, empirical associations have been researched between social capital and earnings (Growiec & Growiec, 2014; Shen & Bian, 2018), social capital and happiness (Bjørnskov, 2008; Leung, Kier, Fung, Fung & Sproule, 2011; Mota & Pereira, 2008; Rodríguez-Pose & Von Berlepsch, 2012) and social capital and health (Lee, 2018; McPherson, Kerr, McGee, Cheater & Morgan, 2013; Nieminen, et al., 2013; Rocco & Suhrcke, 2012). On a societal level, the World Economic Forum recognizes social capital as being one of the factors that drives long-term growth, prosperity and competitiveness (Schwab & Sala-i-Martin, 2017). Several empirical studies find positive effects of social capital on economic growth (Helliwell, 1996; Helliwell & Putnam, 1995; Knack & Keefer, 1997; Neira, Vázquez & Portela, 2009; Peiró-Palomino & Tortosa-Ausina, 2015). Lastly, membership in social organizations is found to be positively associated with human development (Christoforou, 2010). In contrast to aggregate output, human development also measures other key dimensions of welfare: having a long and healthy life, the ability to acquire knowledge and having a decent standard of living (Jahan, 2016). Therefore, when trying to determine society's welfare, it is more interesting to look at human development than just at GDP or income.

One largely overlooked part of social capital is generosity. Charitable behaviour can be regarded as social capital because it belongs to one's civic engagement. None of the mentioned studies has taken this into account. Specifically, Christoforou researched the effects of social trust, civic norms and group membership on human development. Her study is used as basis for the coming analyses because it uses human development as outcome variable. To add to this research, a different part of social capital is analyzed, which is civic engagement in the form of charitable behaviour and generosity. Therefore, the main research question is:

What are the effects of social capital in the form of generosity on human development on an aggregate level?

This question is answered by first (largely) reproducing the study of Christoforou, but then with generosity as element of social capital. Secondly, most researchers, inluding Christoforou, have used cross-country analyses to examine the effects of social capital. This study also includes panel data analyses. Lastly, Christoforou only describes relationships between social capital and human development, but doesn't address the question of causality. This paper does try to do that.

What social capital, generosity and human development precisely entail and why they are important is explained in section 2. Section 3 then presents an overview of empirical analyses that have already been performed regarding the different elements of social capital. These are used in section 4 to formulate the expected effects of generosity on human development. How these hypotheses are exactly tested is described in section 5. Section 6 follows with the results of the performed analyses. Lastly, section 7 concludes and contains soms remarks regarding possible future research.

2. Theoretical framework

Before we can delve into the effects of social capital on human development, we need to define these concepts. What social capital is and why this and in particular generosity are important, is portrayed in 2.1. The definition and factors of human development are discussed in 2.2.

2.1. Social capital

All social 'assets' that people possess together are called social capital. There is a wide range of definitions when it comes to social capital but the main elements are the networks, trust, norms and reciprocity that exist between individuals and groups. According to Krishna and Uphoff (1999), social capital refers to societies' internal social and cultural coherence, the norms and values that regulate interactions among people and the institutions in which they are planted. Social capital can be divided into two categories: structural and cognitive. The first category consists of roles (e.g. who makes the decisions, who oversees the use of resources or who facilitates communication, coordination and conflict resolution) and social networks augmented by rules, procedures and precedents. The second category contains shared norms, values, attitudes and beliefs like primarily trust, solidarity and cooperation but also honesty, egalitarianism, fairness, participation and democratic governance. Structural and cognitive forms of social capital are interactive and complementary but the former are relatively objective and external while the latter are essentially subjective and internal. Both categories qualify as capital because they both require some investment, whether it's in the form of money, effort or time.

The OECD (Scrivens & Smith, 2013) splits social capital into four components. These components are personal relationships, social network support, civic engagement, and trust and cooperative norms. Personal relationships refer to the people someone knows and the social behaviours that add to the establishment and maintenance of these relationships, such as spending time with others or communicating in any way. Social network support refers to the (emotional, financial, intellectual, material, practical or professional) resources that each person has access to through their own social networks. Hence, social network support is a direct outcome of the personal relationships one has. These networks as part of social capital can be further categorized by differentiating between bonding and bridging social capital (Putnam, 2000; Growiec & Growiec, 2014). Bonding social capital emphasizes within-group relations and hence between similar people. Strong intracommunity ties give families and communities a sense of identity and common purpose (Astone, Nathanson, Schoen, & Kim, 1999). However, without intercommunity relationships (i.e. bridging social capital) with dissimilar others (e.g. different social groups, social class, race and religion), communities might just pursue their own partisan goals (Woolcock & Narayan, 2000; Gittell and Vidal 1998; Granovetter, 1973). The third element of social capital is civic engagement, which encompasses the activities and networks through which people contribute to civic and community life. This includes donating, doing voluntary work, being a member of a political group or other social groups and any other form of communal action. Lastly, trust and cooperative norms refer to the trust, social norms and shared values that are needed for society to run properly and that make mutually beneficial cooperation possible. Both generalised trust (i.e. trust in others, including strangers) and institutional trust (e.g. trust in political institutions, legal authorities and the media) are forms of social capital. Norms of non-discrimination and reciprocity are also part of this fourth component of social capital (Scrivens & Smith, 2013).

2.1.1. The importance of social capital

By working together and helping each other, people can create more gains than just the sum of what they can create individually. These mutually beneficial collective actions (MBCA) can produce positive-sum outcomes. Such relations at the individual or group level can facilitate cooperation at national or societal levels which is more favourable than individuals' behaviour to maximize their own welfare. However, economists have found it difficult to explain cooperative behaviour to create mutual gains, because of transaction costs and deterrents such as free-riding. Individualistic self-interest-maximizing concepts of motivation often don't explain why individuals would want to take part in MBCA because of these problems. The concept of social capital accounts for people's willingness to work together for mutual benefit and it deals with why societies as a whole can attain a higher level of production than just the sum of available resources. The structural category facilitates MBCA through established roles and social networks supplemented by rules, procedures and precedents, while the cognitive category inclines people to work together on the basis of shared norms, values, attitudes and beliefs (Krishna & Uphoff, 1999). For instance, a group of people that have extensive trust in each other is able to accomplish a lot more than a similar group that lacks this trust (Coleman, 1988), and this trust makes it easier to solve collective action problems such as the allocation of common resources or dealing with negative externalities like pollution. That way, social capital has a direct positive effect on economic growth (Ostrom, 1990; Ostrom, Gardner and Walker, 1994). Some studies that indeed find that people are more inclined to participate in MBCA due to social capital are Uphoff and Wijayaratna (2000), Isham and Kähkönen (2002), and Krishna and Uphoff (2002). These studies show that a number of social capital factors, such as generalized trust and social networks, lead to a significantly higher development performance. In that sense, also the World Economic Forum recognizes social capital as being one of the factors that drives long-term growth, prosperity and competitiveness (Schwab & Sala-i-Martin, 2017).

Christoforou (2010) also claims that social capital (through features like trust, norms and networks) facilitates coordinated actions between parties with conflicting interests as to create mutual benefits. These features motivate social organizations and state institutions to work together and form synergetic relationships. This in turn promotes not only economic components of human development, like income, but also non-economic elements, like health and education through the extension of the provision of public goods. This provision depends on institutional and governance systems that function beyond the market and in turn lean on elements of social capital (Ostrom, 2007). Heller (1996) also states that synergetic relationships between government and society can create political processes and institutional forms that promote development objectives. These objectives bear in mind the fulfilment of basic needs and the growth of human resources. As such, they include attaining high levels of health, education and participation in political and social institutions (Adelman, 1975; Sen, 1999).

Coleman (1988) thinks that the most important factor of social capital is the trustworthiness of the social environment. A person might be inclined to do something for another if he trusts that the other will reciprocate in the future. This establishes an obligation on the part of the other to actually uphold his part of the agreement. Thus, trust facilitates social interactions that would otherwise not occur and it promotes norms which make people abstain from self-interested behaviour and instead act in the groups' interests in order to solve collective action problems. As will be shown in chapter 3, trust is the main element of social capital which is broadly empirically researched and it might well indeed be the most important factor. However, this does not mean that other components don't

have significant positive effects on economic and non-economic variables. That some components of social capital can have different effects than others implies that social capital is heterogeneous and that in order to influence something it might matter which form of social capital is used (Neira, Vázquez & Portela, 2009).

2.1.2. Social cohesion

Social capital has to be differentiated from social cohesion. The difference is that social capital refers to a group of individuals while social cohesion includes the entire society (OECD, 2011). Social cohesion can be seen as a positive result of the formation of social capital by all individuals in all communities in the country. More social cohesion can in turn lead to the development of more social capital, hence creating an upward spiral (Cloete, 2014).

2.1.3. Generosity

We know now that social capital helps with the willingness of people to work together to create mutual gains from which all participants can benefit. One part of social capital is civic engagement. People contribute to civic and community life by doing voluntary work, donate money to charity, participate in political actions and being part of social groups like sports clubs. In this research, the focus is on the effects of generosity as part of social capital, since this hasn't been researched yet. From the different components of social capital, generosity seems like the odd man out. People benefit clearly from personal relationships and the social network support that they receive from these relationships. Because of trust and shared norms and values people are inclined to work together in spite of the possibility that someone could abuse that trust by freeriding or shirking. The upside for them are the created mutual gains. When someone performs charitable behaviour, however, such a clear advantage is lacking since a donator doesn't get something in return. In my opinion, that makes this factor of social capital particularly interesting. Intuitively, you might think that the chances of generosity having a significant effect on different economic variables would be smaller in comparison to other elements of social capital. To see whether this is the case is precisely the goal of this paper. The quantitative amount of generosity is not researched but only whether someone performed generous acts or not.

So what is generosity exactly? In general, generosity is the virtue of being unattached to material possessions, which is frequently portrayed by the giving of gifts (Pakaluk, 2005). This can also be described as charitable behaviour where someone donates time, money or other assets to help someone in need. The level of giving in a country indicates something about the strength of civil society since it demonstrates to which extent individuals are willing and able to contribute towards addressing the needs of others. Charitable behaviour is part of one's civic engament of individuals and hence part of social capital. In this paper, generosity consists of three charitable behaviours, which are giving money to an organization, volunteering time to an organization and helping a stranger (Charities Aid Foundation, 2010).

As already mentioned, the World Economic Forum recognizes social capital as being one of the factors that drives long-term growth, prosperity and competitiveness (Schwab & Sala-i-Martin, 2017). One of the three indicators they use to construct their Global Competitiveness Index is generosity among the population (i.e. the average percentage of people in each country who either donate money, perform voluntary work or help a stranger). This stresses the importance of generosity as element of social capital.

2.1.3.1. Why does generosity exist?

It seems logical that people are more inclined to work together and are able to work more efficiently together and hence increase overall welfare if they form personal relationships, receive support from these relationships, trust each other and have the same norms and values, even when there is a possibility that working partners try to freeride or shirk. As said before, unlike in these situations, not everyone benefits when someone performs generous acts towards someone else. Why is it then that people are willing to volunteer, donate or contribute to civic and community life in any other way when this doesn't necessarily ensure them of any payoff? In other words, why does generosity exist?

As early as the 18th century, the contrast between people performing self-interested market behaviour (Smith, 1776) and people performing acts out of social, altruistic and moral reasons (Smith, 1759) has been discussed. Smith believed that the pursuit of self-interest could lead to a socially efficient outcome through market exchanges. On the other hand, people tried to form a moral self by performing acts of sympathy. This contradiction was sometimes viewed as problematic in economic theory during the 19th century. Two analytical notions proved helpful in addressing this problem. The first came from Wicksteed (1910). He characterized human market behaviour not as self-interested but as 'non-tuistic', meaning that it is neither egoistic nor altruistic but that it comes forth from some type of instrumental rationality which is compatible with the large variety of human goals. The second analytical contribution came from Pareto (1916). He invented the concept of what we call Pareto efficiency or optimality. This is a state of resources in which it is impossible to reallocate any of the resources in order to make any one individual better off without making at least one other individual worse off. According to Pareto, people have two complementary forms of utilities. An individual derives utility from his own market consumption as well as from the abilities from others to consume. So, individuals care in some way about their own wealth as well as about the wealth of others. We can say that each individual has specific preferences for the distribution of wealth. When someone donates some of his wealth to another, this is in line with their own preferences. Gift-giving is in that sense a rational action. Both the donator and the beneficiary are better off until one of them has reached his optimal preference. If reallocation takes place after that point, one of the parties will be worse off than before. Hence, Pareto optimality has been reached (Ythier, 2006).

Economically speaking, gift-giving makes sense as people are acting according to their preferences. This is called the social equilibrium theory of gift-giving. The positive valuation of the receiver's wealth by the donator stems from nothing else than the sole interest of the donator in the welfare of the beneficiary. There is no other internal or external reward and it could even lead to a net welfare loss due to transaction costs that come with the reallocation of resources. In economic theory this is called pure altruism (Becker, 1976). However, an altruistic act can come forth from other motivations than purely altruistic ones. There are also other, sociological and psychological, explanations for charitable behaviour. Elster (2006) divides the sources for altruistic acts into three categories: interest, passion and reason. Interest refers to the concern people have for the absolute level of welfare of others. This concern can stem from a purely altruistic attitude but also from self-interest. One may want to build up his own reputation or to increase the likelihood of positive reciprocal behaviour. Passion encompasses negative emotions such as anger, envy, fear and shame but also positive emotions such as sympathy and love. Concerns for the distribution of societal welfare are grounded in such emotions. An emotion-based desire to increase the welfare of others at one's own expense can be seen as an altruistic motivation while the desire to be well thought of or not be badly

thought of by others could incline a person to behave altruistically while he in fact does not care about other people's welfare. This is clearly a non-altruistic motivation for altruistic behaviour. By reason, any benevolent and impartial motivation is meant. For instance, a desire to improve the welfare of the worst-off, whoever they might be, is an impartial motivation that altruism can derive from. Reason is not the same as rationality though (Elster, 2004). These three motivations often work simultaneously and it is clear that they enclose both altruistic and non-altruistic or even egoistic motivations.

The motivation often depends on the social context. In familial contexts, feelings of love and sympathy play a major role. In charitable contexts, motivation often comes from philanthropy and is often accompanied by feelings of pity or compassion. In socio-political contexts, feelings of solidarity and of fraternity are key (Ythier, 2006).

Another important insight regarding motivation for altruistic acts comes from Andreoni (1989, 1990). His explanation for altruistic acts is that people engage in impure altruism. They don't engage in pure altruism since they also receive utility from the act of giving themselves. They get a positive feeling from helping their fellow men. Andreoni calls this the warm-glow giving effect. There is even physiological evidence for this effect, which is that the reward centers of the brain get activated when one performs charitable behaviour (Harbaugh, Mayr, & Burghart, 2007). Elster (2006) also acknowledges the warm-glow effect. He states that someone who performs an altruistic act might end up being better off as the result of his material sacrifice because of this effect and he wonders if this person's motivation can then still be seen as altruistic. Elster thinks that this is the case if the warm glow is a mere side-effect but not if it is the aim of the action in the sense that someone would not have undertaken the action if it weren't for the warm glow. Telling the difference between these two situations is very difficult though.

We can conclude here that there are many reasons for people to perform altruistic acts. Their motivations can be altruistic as well, but they can also stem from their self-interest or lie somewhere in between.

2.1.3.2. Why does generosity between countries differ?

All countries, cultures and faiths have their own traditions of giving which are complex and shaped by their own history (Charities Aid Foundation, 2010), but what exactly are the factors that shape the level of giving in a country? A distinction needs to be made between aggregated individual-level factors and contextual factors. The first category entails those characteristics that individuals have that are known to promote charitable behaviour, like educational level, financial and social resources, and religious, political and prosocial values (Bekkers & Wiepking, 2011a; Brown & Ferris, 2007). The second category comprises of country-specific characteristics that influence charitable giving, which includes the type of non-profit sector (i.e. the sector that encompasses charitable organizations), market failures, government failures, government policy (i.e. fiscal incentives for giving, government subsidies and government regulations for the non-profit sector) and culture (i.e. religion and fundraising professionalism) (Wiepking & Handy, 2015).

The type of the non-profit sector in a country is important because this might determine whether the primary source of funding of the non-profit sector is private generosity or the government (Salamon & Anheier, 1998). How a country deals with market failures is related to this. For some goods and services, there is no incentive for the market to provide them, because they are public in nature.

However, these goods and services can be valuable for society (and they include goods and services of a charitable nature). This often results in the government providing them (e.g. national defence), but it is also possible that non-profit organizations take on this task. If the government subsidizes these goods and services, the level of giving is lower, whereas if non-profits provide them, the level of giving is expected to be higher because non-profits require alternative funding. Even if the government provides public goods and services, it will be unable to satisfy all citizens (i.e. there is government failure). The unsatisfied citizens can resort to the private sector or non-profit organizations in order to get the goods and services that are in line with their preferences. This influences the size of the non-profit sector in a country and hence the amount of individual giving. Thus, the more heterogeneous the population of a country is, the larger the non-profit sector needs to be in order to fulfil all the different preferences (Wiepking & Handy, 2015).

Regardless of whether the non-profit sector supplements or (partly) replaces the government in the provision of public goods and services, the government also interacts with the non-profit sector. The government can affect private donations to non-profits in three ways. Firstly, government subsidies to non-profits can crowd out private giving because the non-profits don't need to do a lot of private fundraising anymore, which lowers citizens awareness of the problem and in turn their donations (Bekkers & Wiepking, 2011b). Even if they are still aware, people may consider government subsidies to be a substitute for their own contributions, which also results in less donations. On the other hand, there could also be a crowding-in effect. Because of the government funds, charitable organizations have more money available for fundraising which would increase charitable giving again. Also, government funding can be seen as a signal of trustworthiness and since private donators find it important that their donations actually end up with those they are intended for (Bekkers, 2003), they may donate more if their government trusts this organization (Salamon & Anheier, 1998; Wiepking & Handy, 2015). Secondly, the government can impact charitable behaviour by providing fiscal incentives. Charitable giving is tax deductible in many countries, which increases donations and can explain differences between countries (Colombo, 2001; Dehne, Friedrich, Nam & Parsche, 2008; Koele, 2007). Thirdly, non-profits are often subject to some form of government regulation, which is mostly aimed at increasing accountability and transparency (Lipsky & Smith, 1989). Higher levels of these factors can induce citizens to donate more since charities are then more trustworthy. Even if there is no or weak government regulation, self-regulatory systems and third party monitoring are often used, which have the same effects on accountability and transparency (Ortmann & Svitkova, 2007; Wiepking & Handy, 2015).

In addition to these influences by the government, the culture in a country is also of importance and then mainly its religious context (Bennett, 2013; Borgonovi, 2008; Lim & MacGregor, 2012; Ruiter & De Graaf, 2006). Persons in more religious countries are more likely to volunteer because the likelihood of their social networks being religious is higher. Recruiting volunteers from these networks creates a stronger norm to volunteer within the network, which in turn creates a social pressure for others within the network to also volunteer (Ruiter & De Graaf, 2006). Lastly, the professionalism of fundraising in a country is essential for raising money since it is estimated that up to 85% of donations follow from fundraising (Bekkers, 2005; Bryant, Slaughter, Kang & Tax, 2003). The ways of raising funds and the levels of professionalism used vary a lot between countries, which could drive the differences in giving (Wiepking & Handy, 2005).

In conclusion, not just individual characteristics determine how much one donates, but country-specific factors also affect this. The relationship between the non-profit sector and the government is key as well as the culture of the country, which of course is formed throughout history and is different for every country.

2.2. Human development

One major economic variable that is extensively used in economic research to describe economic progress or welfare is (the growth of) aggregate output / the Gross Domestic Product (GDP). GDP might be a readily and easily usable variable but it has plenty of limitations. It doesn't take into account environmental damage (Van den Bergh, 2010; Gertner, 2010), the distribution of income in a country (US Bureau of Foreign and Domestic Commerce, US Seventy-Third Congress & Kuznets, 1934) and the value of household work and other unpaid work (Nussbaum, 2013). Furthermore, an increase in GDP doesn't necessarily lead to a higher standard of living, especially when it comes to education and healthcare (Drèze & Sen, 2013). Of course, it is difficult to construct a variable that takes all this into account but plenty of alternative options have been developed. One of these is the Human Development Index (HDI). In contrast to aggregate output, human development also measures other key dimensions of welfare: having a long and healthy life, the ability to acquire knowledge and having a decent standard of living (Jahan, 2016). The indicator for the health dimension is the life expectancy at birth. The education dimension consists of two indicators: expected years of schooling and mean years of schooling. Gross National Income per capita is used for the standard of living dimension (United Nations Development Programme, 2016b).

3. Empirical analyses

Many effects of social capital have been empirically investigated. In this chapter a number of studies are discussed: in section 3.1 research that focuses on the effects of social capital on overall human development economic output and in sections 3.2, 3.3 and 3.4 studies about the effects of social capital on the three dimensions of human development; economic output, health and education.

3.1. Human development

Christoforou (2010) argues that elements of human development, such as health and education, are influenced by social capital. She states that social capital encompasses attributes of social organization, such as trust, norms, and social networks, and that it facilitates coordinated action between people with conflicting interests so they can create mutual gains. Therefore, it can lead to synergetic relationships between social organizations and state institutions. In turn, this would positively influence health and education, and hence human development, since these depend on public policy, public provisions and participation in social and political instutions. Cross-country regressions were done for European countries to examine the effect of several measures of social capital on the HDI, which are social trust (i.e. the percentage of respondents who trust most people (Knack & Keefer, 1997; Zak & Knack, 2001)), civic norms (i.e. the extent to which respondents justify a number of uncivil actions (Oorschot & Arts, 2005)) and group membership (i.e. the percentage of respondents who are part of at least one social organization (Beugelsdijk & Schaik, 2005)). According to previous studies, social trust and civic norms increase economic output but the effects of group membership are inconclusive. The explanation is that social trust and civic norms reduce transaction costs as well as information assymmetries and therefore add to efficiency. On the other hand, group membership is often accompanied by rent-seeking and lobbying by special-interest groups. (Knack & Keefer, 1997; Olson, 1996; Streeten, 2012; Woolcock, 1998). These actions reduce efficiency and welfare and therefore dampen any positive effects.

Now back to Chirstoforou's research. Firstly, group membership is found to have a statistically significant and positive effect. This is not in line with empirical work as described above. Christoforou's explanation for this is that participation in social organizations has an impact on human development because these organizations work together with the state in deciding on public policy and the provision of public goods and they also diminish market and state inefficiencies. However, group membership seems to have different effects in different regions. This could be because the synergy between social organizations and the state is dependent on the welfare system of the country. Some welfare systems encourage generalized norms and networks of cooperation more than others. Synergetic relationships are stronger in these countries, which means that the ability of groups to stimulate human development through public policy and the provision of public goods becomes larger. Secondly, social trust has a positive but statistically insignificant effect, which also goes against the general empirical consensus. Perhaps human development depends less on how much civilians trust each other and more on their ability to organize, cooperate and set goals to fulfill development objectives. Lastly, the only specification in which civic norms is statistically significant suggests that human development actually improves with more uncivic behaviour. The offered explanation is that in countries that have less effective and accountable public institutions, increases in development are more dependent on the capacity of people to improve their individual welfare by engaging in more uncivic trades. Since this variable was so difficult to interpret, it was dropped in the final specification (Christoforou, 2010).

Razmi, Salimifar and Bazzazan (2013) research the relationship between social capital and human development in a number of Islamic countries. Like Christoforou, they make use of the HDI. They express difficulty with constructing a solid measure of social capital since it consists of so many elements. As alternative, they use the Corruption Perceptions Index. Corruption in the political system leads to diminishing levels of (institutional) trust and highly corrupt countries are indeed found to be the ones with the lowest levels of trust (Svendsen, 2003). Therefore, the presence of corruption indicates lower levels of social capital. The results show that the Corruption Perceptions Index has a positive association with the HDI which indeed implies that less corruption leads to more development (since a higher Corruption Perceptions Index number illustrates less corruption). This result holds when GDP per capita, life expectancy and infant mortality rate are controlled for. The same effect is also found by Fanni and Alizadeh Sani (2007). Hence, these studies are further evidence that social capital positively impacts human development.

3.2. Economic output

The first dimension of human development is the standard of living dimension which is determined by the economic output of a country. On a societal level, some of the first studies that examine the relationship between social capital and economic output come from Putnam and Helliwell. Putnam (1993) studies the differences in productivity (in the form of income per capita) between regional governments in Italy. It is found that the best performing governments are those where the extent of civic engagement is greatest. According to Putnam, an active civic community leads to higher institutional performance, which in turn results in higher performance. A civil society creates wealth, not the other way around. Helliwell and Putnam (1995) also use civic community as indicator of social capital, which comprises measures of the breadth and depth of civic community and measures of political participation. With this index of social capital they try to explain regional differences in the level and growth rate of GDP per capita throughout Italy. The effects of civic community are found to be positively significant. Unlike in these two studies, Helliwell (1996) finds a significant negative relationship between social capital and economic development for 17 OECD-countries between 1962-1990. He looks at social trust and organizational membership as two key aspects of social capital. The effects of both these dimensions are negative as well as the effect of a weighted combination of these two.

Neira, Vázquez and Portela (2009) acknowledge social trust as the must important factor of social capital, since it reduces transaction costs, facilitates information flow and stimulates welfare-increasing MCBA. Next to investigating the effect of trust in the form of social confidence (i.e. whether people think most others can be trusted) on economic output measured in terms of GDP, another proxy for social capital is used, which is group membership (i.e. the percentage of people who belong to some type of organization). It is assumed that these two variables are the most representative and the best available. Both trust and group membership are found to have a positive influence on economic growth in European countries. Both effects are of similar magnitude. The conclusion is reached that social capital is a variable that can explain economic growth in developed countries, but not to the same degree as human and physical capital. In that sense, social capital does not guarantee growth by itself, but only the right combination of the different types of capital can achieve long term growth. That also includes the different heterogeneous forms of social capital. The size and combination of social capital elements have to be considered. Another issue to keep in mind is that different stages of development might require different needs.

Peiró-Palómino and Tortosa-Ausina (2015) also explore whether social capital could explain the differences in GDP per capita growth between regions, but they use Spanish provinces. They also show a significant and positive impact of social capital on GDP per capita growth, which implies that social features are important for explaining wealth differences across Spanish provinces. An endogenous view of social capital is used in which social capital is seen as an asset in which the actors in a certain economy invest. This implies that social capital comes from within individuals and organizations and that a stock of social capital can be formed by investing in reciprocal trust relationships through participation and cooperation in society. Opportunistic behaviour would then be penalized by denying participation access. One would lose the opportunity to share in the aggregrated benefits. This would ensure the exclusion of freeriding. Social capital can be regarded as an input in the production process just as other types as capital. People invest in social capital because they expect future positive returns from that investment and because social capital reduces transaction costs which is also a benefit. Another interesting finding is that social capital also has a positive significant effect on private physical capital investment. This implies that social capital has an indirect effect on growth through investments. Economies with high levels of social capital possess elaborate social networks that induces cooperation. This reduces supervision costs and might stimulate the use of credit instruments for investments, hence increasing total investment activities (Guiso, Sapienza, & Zingales, 2004).

Whitely (2000) finds similar results to Neira, Vázquez and Portela (2009) in the sense that he finds that social capital significantly and robustly causes economic growth. Like Peiró-Palómino and Tortosa-Ausina (2015) he also finds that this effect is smaller than that of human capital on growth and that social capital, physical capital and human capital all contribute to economic growth when added to the equation together. Knack and Keefer (1997) also reach the conclusion that generalized trust has a significant positive association with stronger economic performance. In addition, they find that civic cooperation, measured by the extent to which people justify pro-social actions like paying taxes or not accepting bribes, has the same outcome but that group membership does not have a significant effect, as opposed to Neira, Vázquez and Portela. Beugelsdijk and Schaik (2001) find the same results regarding trust and group membership. Zak and Knack (2001) also find that high-trust societies display higher rates of both growth and investment. This is further evidence that social capital might have an indirect effect on economic growth through the investment channel as described in Peiró-Palómino and Tortosa-Ausina (2015).

Every positive individual effect also positively influences the aggregate effect. On an individual level, it is found that high levels of trust at the workplace improves the flow of information and decreases stress. Hence, transaction costs in doing business are effectively reduced (Ostrom & Walker, 2003; Williamson, 1981). Furthermore, networks and the support that flows from them can help workers find better suited jobs (Growiec & Growiec, 2014) which would lead to higher individual productivity and therefore more allocative efficiency and more economic welfare for society. Especially people with strong bridging social relationships (i.e. ties with people from a different social-economic position) are more likely to end up in more efficient working places. On the other hand, individuals that only have strong bonding social ties (i.e. relationships with family, friends and other people with similar sociodemographic or socioeconomic characteristics) might only rely on (limited) job opportunities offered by the members of the group that might not be in line with their qualifications or expectations. Furthermore, strong bonding ties might inhibit individuals to explore the labor market fully (Kääriäinen & Lehtonen, 2006; Alesina and Giuliano, 2010; Growiec & Growiec, 2014).

Granovetter (1973) indeed finds that bridging social ties are more useful for finding better suited jobs than bonding ties. Burt (2005) also states that bridging social capital is more rewarding than bonding social capital since it leads to better individual economic performance, creativity and social trust, which in turn increase societal performance.

All in all, there seems to be major evidence for a robust positive relationship between trust and economic growth but the effects of civic engagement and group membership are ambiguous with some proof for and some against a positive relationship. Notable is that all these studies focus on trust and some include civic engagement, but none look at the effects of generosity. Generosity is also part of civic engagement, but only other elements were researched.

3.3. Health

One of the dimensions of human development is health. Multiple studies have examined the relationship between both bonding social capital and bridging social capital with health on the country level. Some of them show positive effects of both kinds of social capital on health (Kim, Subramanian & Kawachi, 2006; Kishimoto, Suzuki, Iwase, Doi & Takao, 2013; Meng & Chen, 2014; Poortinga, 2012) while others find that bridging social capital positively influences health, but that bonding social capital has a negative association with health (Leung, Chin, & Petrescu-Prahova, 2016; Mitchell & LaGory, 2002; Stafford, De Silva, Stansfeld, & Marmot, 2008). There seems to be a consensus that at least bridging social capital has a positive impact on societal health. The possible negative effect of bonding social capital might be due to the fact that groups with strong intragroup relationships exclude non-members and share limited information with other groups. Furthermore, bonding social ties make it easier to collectively sanction infractions of social norms, which can cause mental stress (Kim, Subramanian & Kawachi, 2006; Mitchell & LaGory, 2002). Lee (2018) aims to investigate this distinction between bonding social capital and bridging capital further. He also includes aggregate social capital. He uses general trust as index for aggregate social capital since it doesn't differentiate between trust in similar and in dissimilar people. The reliogisity index is used as a proxy for bonding social capital and it is defined as the percentage of the population who are a member of religious organizations. This represents bonding social capital well since these groups are homogenous. The rule of law index (i.e. the extent to which people have confidence in and abide by the rules of society (Kaufmann, Kraay, & Mastruzzi, 2010; Lee, 2017) is used as a proxy for bridging social capital since it reflects social trust among socially heterogeneous groups in a country. The dependent variables are two widely used measures of health, namely life expectancy at birth and infant mortality rate. The results suggest that bonding social capital has a negative effect on health, that bridging social capital positively affects health and that general social capital has an insignificant effect. Given the opposite effects of bonding and bridging capital, this last finding is not surprising.

In the end, if social capital influences society's health, it does so through influencing individuals' health. Therefore, data on an individual level is crucial to determine the relation between social capital and welfare or health. Rose (1999) finds that social capital networks substantially affect emotional health. Basically, the less socially excluded one is and the more network support someone has, the better is his emotional health. Network support and trusting other people are also significant for physical health. However, the effects are much smaller than for emotional health and also not as important as the effects of socio-economic factors as age, income, education, gender or social status.

McPherson, Kerr, McGee, Cheater and Morgan (2013) review a bunch of papers regarding the effects of (bonding) network support on the general health of children and adolescents. The studies that assess family social capital (i.e. interactions with family) provide evidence that good parent-child relationships positively influence a child's general health (Wen, 2008; Berntsson, Kohler & Vuille, 2006; Eriksson Hochwalder & Sellström, 2011). Regarding community social capital (i.e. interactions between families and their local communities), children and adolescents who have more extensive or higher qualitative social support networks, either their own or their parents', benefit in terms of having better general health (Morgan & Haglund, 2009; Zambon et al., 2010; Wen & Lin, 2012; Dunt, Hage & Kelaher, 2011; Berntsson, Kohler & Vuille, 2006; Eder, 1990; Eriksson, Hochwalder & Sellström, 2011). Interestingly, this contradicts the findings of a number of studies that find the relationship between bonding social capital and health to be negative on a societal level. However, there is also country-level research that does find a positive effect.

Yet another study that explores how various elements of social capital are related with health comes from Nieminen et al. (2013). They try to uncover the effects of social capital on health-related behaviours (i.e. alcohol usage, physical activity, sleeping, smoking and vegetable consumption), self-rated health and psychological well-being, and whether these behaviours explain the relationship between social capital and self-rated health and well-being. The results show that social participation and networks are significantly linked to more healthy behaviour while trust and reciprocity and social support are only significantly related to some of the health-related behaviours. All elements of social capital are separately connected to self-rated health. Also, social participation and trust, but not support, correspond with psychological well-being. Only physical activity mediates the relationship between social participation and both self-rated health and psychological well-being, which supports the conclusions of Mohnen, Völker, Flap and Groenewegen (2012). In no other case does any healthy behaviour mediate the effects of social capital. Hence it seems that the different dimensions of social capital indeed contribute to individual health and hence to societal health.

3.4. Education

Regarding the last component of human development, which is education in the form of both expected years and mean years of schooling, there is said to be a positive relationship between social capital and academic succes. When it comes to education, social capital takes the shapes of parental expectations and involvement, social networks that exist within and between the family, the school and the community and the social norms at the school that promote students' efforts.

Coleman (1988) argues that the educational expectations, norms, and obligations that exist within a family or a community can affect the amount of involvement and investment of the parents in their children's education, which in turn influences academic performance. At the familial level, parents' human capital and financial capital can further the child's educational progress but only if the social connection between the child and the parents is sufficiently strong. This social connection depends on both the physical presence of the parents and on the attention they give their children. Single-parent families, families in which one or both parents work outside the home and families with larger numbers of siblings (because of a dilution of attention) can all be seen as structurally deficient and lacking in social capital. Students from these families are more likely to drop out of high school because of the eroded social capital. But even if adults are physically present, there is a lack of social capital in the family if there are no strong relations between children and parents. Coleman (1987, 1988, 1994) and Bourdieu (1986) state that the way certain types of parental investment and

involvement can contribute to the child's educational prowess is through self-esteem. Another study's findings are in line with this statement. Ho (2003) reports that parental investments (in the form of family resources, books, study space, and magazines) and parental involvement (in the form of learning support and school donations) significantly enhance students' self-esteem. Especially learning support (e.g. concern about study progress, supervising homework and discussing TV programs) has a great impact, which is larger than the influence of parental investment and of both student and school background. Just like Coleman (1988), Ho finds that the impact of occupation and education of the parents only influences the childrens' self-esteem and academic performance when there is parental involvement and investments, but parents' involvement seems to be more important than investments.

In the school community and between the school and the parents, trust between students, parents, teachers and principals creates mutual expectations and obligations (Plagens, 2011; Bryk and Schneider 2002). Parents expect teachers to do their best to help their child learn and teachers feel obligated to fulfill these expectations. Parents are, on the other hand, obligated to make their children attend school and support their educational work at home. Trust is important to uphold the quality of this relationship and is thus very important in the school setting (Plagens, 2011; Bryk & Schneider, 2002; Kramer, Brewer & Hanna, 1996; Tschannen-Moran, 2004; Bies & Tripp, 2004). Ho (2000) also confirms that the mutual trust between home and school are major forms of social capital that has a significant impact on not only creating a learning environment but also on improving the quality of schooling. The disciplinary climate and academic norms established by the school are also of great importance in this regard.

Byun, Meece, Irvin and Hutchins (2012) examine the effects of family social capital and school social capital on the educational aspirations of rural youth. Students were asked how far in school they want to go (i.e. whether they just want to finish high school or go to college or obtain a Ph.D. and so forth). These answers were transformed into a number of years of schooling. When it comes to family social capital, the results show that parental educational expectations as well as frequent discussions between parents and children about attending and paying for college both are positively related to educational aspirations, whereas the number of siblings and the number of siblings dropping out do not have a significant effect. Regarding school social capital, teachers' educational expectations positively affect students' educational ambitions. These results hold after controlling for sociodemographic variables. Furthermore, an interaction effect between two-parent households and parental education is found, which implies that the effect of parental involvement on educational aspirations is higher when the parents have enjoyed more years of schooling themselves, and the other way around. This is in line with the findings of Coleman (1988) and Ho (2007).

To sum up, regarding the effects of social capital on education (in the form of years of schooling and academic performance), there is plenty of evidence for a positive relationship which is caused by parental involvement and investments, parents' and teachers' expectations and obligations, mutual trust and norms that stimulate learning.

4. Expected effects of generosity

It is now obvious that a lot of research has been done on the relationships between social capital and both individual and societal measures of welfare and it seems that social capital does contribute to welfare, at least in some forms and situations. The effects of social trust have extensively been documented and the effects of social networks and civic participation in the forms of organizational membership and political participation have also received a considerable amount of attention. Generosity and charitable behaviour, on the other hand, are very much unexplored factors in the string of social capital research. However, this does not mean that the effects of generosity have not been examined at all. This just hasn't been done in studies about social capital. In this chapter the hypotheses regarding the effects of generosity on several macro-economic factors are formulated. In section 4.1 the expected effect on overall human development is discussed. After that, the expected effects of generosity on the three dimensions of human development (i.e. standard of living in the form of economic output, health in the form of life expectancy and education in the form of expected and mean years of schooling), are presented in sections 4.2, 4.3 and 4.4 respectively.

4.1. Human development

As explained in 2.2, human development consists of three dimensions: the standard of living dimension which is measured by Gross National Income per capita, the health dimension which is comprised of the life expectancy at birth in a country, and the education dimension which consists of both the expected and mean years of schooling. Regarding the effects of generosity on human development in its totality, the expected effects of generosity on the three dimensions of human development, which are discussed in the following sections, can be combined. Positive relationships are anticipated between generosity and both Gross National Income per capita (i.e. economic output) and life expectancy at birth, while no relationship is assumed between generosity and years of schooling. This results in the following hypothesis 1: ***generosity has a positive effect on human development through the standard of living dimension and the health dimension.***

It is possible that people in countries with higher levels of human development tend to give more, as we also see with economic performance in the next section. This possibility of reverse causation has to be taken into consideration.

4.2. Economic output

Starting from an individual viewpoint, generosity can have a positive influence at the workplace. Grant and Berry (2011) suggest that a desire to benefit other people causes employees to consider others and motivates them to create new and useful ideas. Another study finds that bonuses that have to be spent on co-workers increases team performance for sports teams and pharmaceutical teams, whereas personal bonuses do not (Anik, Aknin, Norton, Dunn, & Quoidbach, 2013). This study also finds that enabling employees to spend a prosocial bonus on a charity increases their job satisfaction and having happy employees is good for business performance. In addition, new ideas and increased productivity throughout society contribute to economic output.

Generosity also has benefits for relationships. A willingness to sacrifice for a romantic partner is found to be associated with better functioning relationships (Van Lange et al., 1997), positive emotions and feelings of relationship (Kogan et al., 2010), more satisfaction and less conflict (Dew & Wilcox, 2013). Of course, these studies researched marital relationships, but it is likely that a willingness to sacrifice or performing generous acts also strengthens the relationships between

friends, co-workers or even strangers. Generosity can also play an important role in cases of social noise (i.e. situations where interactions do not go as planned because of unexpected circumstances). Instead of reciprocating the detrimental behaviour of the other, behaving a bit more generously leads to more overall cooperation and stronger relationships (Van Lange, Ouwerkerk, & Tazelaar, 2002). Even in cases without social noise, generosity can build or maintain trust and cooperation (Klapwijk & Van Lange, 2009). If we extend this implication to a societal level, it would be possible for generosity to positively influence macro-economic variables like economic output by creating a more trusting and cooperative civilization. Indeed, Wilkinson and Bittman (2001) state that generosity can create cohesive communities (both internally and externally with other communities) because of greater community involvement. Putnam (2000) also states that civic engagement (including volunteering and other generous behaviour) can broaden community connectedness and positively affect the productivity of individuals and groups.

Additionally, generosity from businesses can help strengthen communities. Businesses that invest in social programs that address poverty don't just help communities, but these investments also positively influence their profitability and long-term sustainability since the relationship between the business and the community becomes stronger (Zadek & Tuppen, 2000) and strong and healthy communities can make booming markets and provide solid employees (IBM, 2008).

While the covered studies have not examined whether generosity affects economic output, it does seem possible that it does by increasing trust in the workplace and in society in general. Because of this trust, people tend to cooperate more, as has already been discussed extensively in sections 2 and 3. Hence, the main channel through which generosity is expected to influence economic performance is trust. That's why hypothesis 2 looks as follows: ***generosity has a positive effect on economic output through higher levels of trust.***

The notion has to be made, though, that countries show higher levels of generosity because they are performing better economically instead of the other way around. List and Price (2012) find that GDP per capita has a statistically significant and positive effect on the giving of money (but not on the giving of time or on helping someone). Contradictory, another study finds an insignificant correlation between GDP per capita and the amount given to charity, but it does show a significant correlation between the overall level of GDP and the amount given (Charities Aid Foundation, 2016). Even so, this study only states a correlation but doesn't go into whether the relationship is causal. In any case, the possibility of reverse causation has to be taken into account.

4.3. Health

Regarding the health dimension, multiple studies find that volunteering is associated with delayed death (and hence with a longer life expectancy). A first study that reported this result, however, finds that if the volunteering becomes more than 40 hours per week, the strain that comes from it might counteract the benefit (Musick, Herzog, & House, 1999). Another study finds that people who had volunteered for two or more organizations are less likely to have died during the five-year study period than people who hadn't volunteered (Oman, Thoresen, & Mcmahon, 1999). O'Reilly, Rosato, Moriarty and Leavey (2017) use married couples to examine the possible health benefits of volunteering. Every couple exists of a volunteer and a non-volunteer. The volunteers show a lower mortality risk, while the non-volunteers do not, despite having the same household characteristics.

There is also evidence for a positive relationship between generosity and both physical and emotional health. Regarding physical health, Tan, Xue, Li, Carlson and Fried (2006) find that older adults who perform voluntary work have higher levels of physical activity than non-volunteers and more physical activity is linked to better individual health. Giving social support (i.e. any giving that has costs, including time, effort, or goods) is also associated with better overall health of older adults (Brown, Consedine, & Magai, 2005). Interestingly, more generous people have better health outcomes regardless of the social support they receive themselves. Another study finds that female (but not male) teens who report helping their families more have better physical health (Schwartz, Keyl, Marcum, & Bode, 2009). De Wit, Bekkers, Karamat and Verkaik (2015) find that the association between volunteering and greater self-reported health can partially be explained by the fact that healthier people are more likely to volunteer. They find a positive effect on health when someone starts volunteering and a negative effect when anybody stops volunteering but this only brings forth a change of 2% in self-reported health at maximum, meaning that the effect is small.

Regarding psychological health, a meta-analysis of 37 observational studies shows that volunteers generally report a greater quality of life than non-volunteers, even after controlling for the possible confounding influence of socioeconomic or health status (Wheeler, Gorey, & Greenblatt, 1998). Kahana, Bhatta, Lovegreen, Kahana and Midlarsky (2013) find that more volunteering corresponds to higher life satisfaction, experiencing more positive emotions and fewer symptoms of depression.

In conclusion, there seems to be considerable evidence for a causal relationship between volunteering and delayed death and between generosity and both physical and psychological wealth. If this is the case, this implies a longer life expectancy. Hypothesis 3 is then as follows: ***generosity (and especially volunteering) leads to longer life expectancy at birth.***

4.4. Education

When it comes to the education dimension, the specific forms of social capital that affect years of schooling are parental involvement and investments, parents' and teachers' expectations and obligations, mutual trust and norms that stimulate learning (see section 3.2.2). These elements fall under the categories networks, support, trust and norms and values. There is no theoretical reasoning for generous behaviour influencing the amount of schoolyears one takes. Therefore, this relationship is not researched further.

5. Data & Methodology

In this chapter, first, the general methodology is discussed in section 5.1. Next, the specific data, the used (control) variables and the special conditions for the different models are discussed. This information is shown for the models with overall human development as dependent variable in 5.2 and for economic output and health as dependent variables in section 5.3.

5.1. General methodology

The main research question aims to complement the research of Christoforou. She did a cross-country analysis of 32 developed European countries. This paper mainly describes panel data analyses for the years 2010-2015 for a largely similar set of countries and some cross-sectional analyses. These specific years are chosen because both the main dependent and explanatory variables are only jointly available for this period of time. In total, 28 countries are included.[1] Missing datapoints have been filled using multiple imputation.

The main question we want to answer is whether generosity has a positive effect on human development. The most obvious approach to examine this relationship is to use a set of regression models. Firstly, the main part of hypothesis 1 is researched (***generosity has a positive effect on human development****)* and after that, we'll look at whether this relationship is indeed through both the standard of living dimension (hypothesis 2) and through the health dimension (hypothesis 3). Christoforou's estimation method is reproduced. The effects of generosity are analyzed by estimating the following general regression:

(*) $Y_{i,t} = \beta_0 + \beta_1 * Generosity_{i,t} + \beta_2 * X_{i,t} + \varepsilon_{i,t}$

Where $Y_{i,t}$ represents a certain outcome (human development, Gross National Income per capita, life expectancy at birth, general trust), *Generosity* represents either the main indicator of generosity or the set of different indicators consisting of donating, volunteering and helping a stranger. $X_{i,t}$ is a vector of control variables which consists mainly of the same control variables as Christoforou used.[2]

The presented regression can be estimated with OLS. However, this comes with a couple of concerns. First of all, generosity is probably an endogenous variable since high levels of generosity (and of social capital in general) probably can be explained by trust which in turn hinges on the relationship between the government and the charitable organizations and the history and culture of a country, as explained in section 2.1.3.2. Generosity is then not randomly distributed over countries and is endogenous. In this case, there can be two reasons for endogeneity in the models (but the one doesn't exclude the other). The first one is reverse or simultaneous causality. It's possible that generosity doesn't lead to higher human development or economic output, but that it's the other way around, or that they influence each other. I try to address this problem by adding lagged values of the generosity variables. Since these lagged variables precede the dependent variable in time, it says something about the direction of the relationship. Lagged values from as far as 4 years back are examined.

[1] The researched countries are Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Turkey and the United Kingdom.

[2] The control variables for the different models will be explained in the following sections. Appendix A also shows a list of all used variables as well as their sources.

The endogeneity can also come from uncontrolled confounding variables which create omitted variable bias. Christoforou dealt with this issue by adding a set of regional dummies to investigate the effect of specific regional characteristics like historical, cultural and institutional features. In this thesis, these country-specific and time-invariant factors are captured by a country fixed effects estimator in a Fixed Effects Model:

(**) $Y_{i,t} = \alpha_i + \beta_1 * Generosity_{i,t} + \beta_2 * X_{i,t} + \varepsilon_{i,t}$

However, this causes an issue with the variation in the values of the explanatory variables. In a Random Effects Model, both the between country variation and the within country variation are examined, but in a Fixed Effects Model, only within country variation is examined. The levels of generosity do vary between countries, but show less variation within countries over time. There are no real drastic changes between years within a country. The consequence of this small amount of variation in the explanatory variable is that it is hard to confidently state the relationship between the explanatory and dependent variables. Alternatively, a Random Effects Model could be used since this also includes the between-variation which is obviously larger than the within-variation of generosity. But then we get the problem of omitted variable bias again. A third and final option is to do cross-country estimations, just like Christoforou did. Then there is plenty of variation and by adding several control variables the omitted variable bias can be reduced. The biggest upside of this estimation method is that (general) trust can now be added to the model. The hypothesis is that trust mediates the relationship between generosity and human development so adding trust to the model allows us to test this hypothesis.[3] On the downside, we do lose a lot of data when doing cross-sectional analysis and the sample size of 28 countries is quite small for this. It also becomes impossible to account for reverse causality since there is no time component in cross-sectional research.

Clearly, each of the three estimation methods (Fixed Effects Model, Random Effects Model and cross-sectional OLS) has its own advantages but also comes with its own set of problems, so there is no clear winner. Therefore, all three estimation methods are used as to present a complete overview of all the results. The issues are kept in mind while discussing the results. At the least, these issues have the consequence that any found relationships between generosity and human development can only be described as correlational and not necessarily as causal.

Lastly, regarding the control variables, even though the used ones are often used in explaining the different outcome variables, for the models with HDI and economic output as dependent variable, the control variables are endogenous. Therefore, for these models, first an estimation without any controls is carried out, followed by an estimation that includes all controls.

5.2. Human development

To estimate the relationship between generosity and human development, Christoforou's estimation method is reproduced. The main dependent variable is the Human Development Index (HDI) which is created by the United Nations Development Programme to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country instead of economic output alone. The HDI conists of three dimensions. The health dimension is assessed by life expectancy at birth, the education dimension is measured by mean of years of schooling for adults

[3] Because data on trust are only available for one year, it could not be included in the panel data estimations.

aged 25 years and more and expected years of schooling for children of school entering age. The standard of living dimension is measured by Gross National Income per capita. The HDI uses the logarithm of income, to reflect the diminishing importance of income with increasing Gross National Income (GNI). The scores for the three HDI dimension indices are then aggregated into a composite index using geometric mean (United Nations Development Programme, 2016b). The HDI index is available up until 2015 and is gathered from the different Human Development Reports.

As for the explanatory variables, Christoforou uses social trust, civic norms and group membership as proxies for social capital. This study uses a different element of social capital, which is generosity among the population. The level of giving in a country indicates something about the strength of civil society, namely the extent to which individuals are willing and able to contribute towards addressing the needs of others. This charitable behaviour is clearly part of the civic engament of individuals and hence part of social capital. The Charities Aid Foundation has constructed the World Giving Index (WGI) since 2010 and it consists of three charitable behaviours: giving money to a charitable organization, volunteering time to such an organization and helping a stranger. The indices each represent the percentage of the population that has demonstrated that kind of behaviour in the month previous to being questioned. The composite WGI shows the percentage of people who performed any of these three generous behaviours (Charities Aid Foundation, 2010). Therefore, the WGI is used as measure of general generosity. The variables don't contain information on how much money someone has donated or how many hours a person has volunteered but only on whether a generous act has been performed. Not only the composite index are analyzed but also the three indices it is based on (donating, volunteering and helping a stranger). These data are gathered from the different World Giving Index reports.

Christoforou uses an extensive set of control variables in her regressions. She finds that public provisions in health and education play an important role in the improvement of human development, as well as their interaction term. She also includes a set of political indicators that consists of the quality of governance, political stability and corruption. Furthermore, economic output and economic variables of international trade and financial development are integrated in some of the models. Lastly, variables of social exclusion (inequality, poverty and unemployment) are used in a part of the equations. Because of limited sample size and a wide array of explanatory variables, she uses each group of control variables in different equations (except for public expenditure variables which were included in all estimations).

The specifications in this thesis contain these control variables but all of them are included in all the models, instead of just in a part of the models. For most variables the same datasets are used that Christoforou uses, but for some, other data are used. For the effect of public provisions Christoforou uses public expenditure on health as percentage share of GDP. This exact variable cannot be found, but presumably she used the variable domestic general government health expenditure (as % of GDP) from the World Bank, which is used for this study. For financial development, Christoforou uses the share of money supply M1 in GDP. However, these data cannot be tracked down using Christoforou's references. Therefore, other measures that represent financial development are used, which are private credit of money provided by banks to the private sector, stock market capitalisation and liquid liabilities to GDP (also known as broad money or M3). The first two indicate the access to funding for capital accumulation while the latter shows the monetization of the financial system (Lawrence & Longjam, 2003). For income inequality the GINI-index is used. For all

other variables, the same statistics are used as Christoforou uses. Appendix A gives a full list of variables, their explanations and finding place.

As discussed in the previous section, both a Fixed Effects Model and a Random Effects Model are estimated. In addition, a cross-sectional OLS analysis is also performed. A variable that represents general trust is included in this analysis. Christoforou (2010) also researched the effects of general trust on human development. For trust she uses the percentage of people that state that, generally speaking, most people can be trusted. She took this information from the European Values Study (EVS) from the years 1999 and 2000 (European Values Study, 2013). Since then, a new wave of people has been questioned, so in this study the same statistic is used, but from the EVS with information from 2008 (European Values Study, 2016). Since there is only available data for general trust for one specific year, panel data estimation is not possible and a cross-country analysis is performed. The data for all variables other than general trust are averaged for all countries for the years 2010-2015, analogous to Christoforou. Since this regression is cross-sectional, we do have to keep in mind the possible problem of reverse causality since the inclusion of lagged variables is impossible.

5.3. Dimensions of human development

Not only the relationship between generosity and the HDI itself is researched, but also between generosity and the components of the HDI. That way, it can be determined through which channels generosity affects human development (if at all). As explained in 4.2.2, generosity is not expected to affect the education dimension of HDI but only the standard of living dimension and the health dimension. Therefore, only models with the latter two as outcome variables are examined. These models have the forms of **(*)** and **(**)** and are further explained in the following two sections.

5.3.1. Economic output

To answer hypothesis 2 (***generosity has a positive effect on economic output through higher levels of trust***) multiple estimations need to be researched. In the first estimation, economic output in the form of Gross National Income per capita is the dependent variable (since this is the variable used to make up the HDI), generosity is the main explanatory variable and a number of confounding variables are added. Known factors that influence economic output include the accumulation of both physical capital (i.e. gross fixed capital formation) and human capital (i.e. mean number of years of schooling), population growth, expenditure on research and development (i.e. overall expenditure on R&D as a share of GDP), inflation (both the level of inflation and its variability in the form of the standard deviation), general government final consumption expenditure (as percentage of GDP), access to funding for capital accumulation (both private credit of deposit money banks provide to the private sector as a percentage of GDP and stock market capitalisation as a percentage of GDP), liquid liabilities as percentage of GDP and international trade (i.e. exports plus imports as percentage of GDP). Lastly, economic output is also said to depend on the value of economic output in the previous period (i.e. lagged Gross National Income per capita). The reasoning is that poorer economies develop at faster rates than richer economies and that all economies converge to its country-specific steady state level of per capita income at some point in time (Bassanini & Scarpetta, 2001). Given the exponential nature of economic output and the expected non-linear relationship between the dependent variable and the independent variables, the model is logarithmically transformed as to create a log-log model, following the estimation method of Bassasini and Scarpetta (2001). Finally, to account for the possibility of reverse causality, a lagged value of generosity is also included.

To test whether generosity actually influences economic output through trust, we need to estimate two models. We need to know whether the relationship between generosity and economic output changes or vanishes when trust is added to the previous models and we need to know whether generosity affects trust significantly. To test the former point, we use largely the same model as before: the dependent variable remains GNI per capita, but instead of a Fixed Effects Model or Random Effects Model a cross-sectional OLS regression is run. This regression includes general trust and it shows whether the effect of generosity on economic output disappears when trust is in play and thus if trust serves as a mediator between generosity and economic output. We again have to consider the possible problem of reverse causality since the inclusion of lagged variables is impossible.

Next, we need to know whether generosity actually positively influences trust. Now, the dependent variable is general trust while either generosity or the set of donating, volunteering and helping a stranger remain the main explanatory variables. Regarding the inclusion of confounding variables, Gao (2017) recently researched which factors influence trust. He finds that some key explanatory variables that positively relate to general trust are fairness, moral satisfaction, opinion similarity, leisure time for rest and leisure time for learning. On the other hand, thinking that others will take advantage of you has a negative effect on trust. Gao uses statistics from China and these are naturally not directly applicable here. In the 2008 EVS, some of these variables can be found directly, like leisure time for rest and learning. Another variable captures both fairness and 'taking advantage' since lower numbers on this scale coincide with people thinking others would take advantage of them and higher numbers represent people thinking others would try to be fair. This variable is change into one that just shows the percentage of people that think others would try to be fair. Regarding moral satisfaction (i.e. whether people are satisfied with the moral status in their country), recall from 3.1.2.1 that Kaufmann, Kraay and Mastruzzi (2010) and Lee (2017) state that the rule of law index represents the extent to which people have confidence and abide by the rules of society. While the EVS 2008 does not contain a rule of law index per se, it does contain a variable 'confidence in the justice system'. The percentage of people that have confidence in the justice system is used as a proxy for moral satisfaction. Alas, the EVS 2008 does not contain any variable that can serve as a representative for opinion similarity. Thus, this is not included in the model. As with regression (4), for generosity the average numbers for the years 2010-2015 are used. Finally, the problem of reverse causality can again arise, but since this is also a cross-sectional analysis this cannot be solved by including lagged variables.

5.3.2. Health

When it comes to the health dimension, hypothesis 3 is that ***generosity (and especially volunteering) leads to longer life expectancy at birth.*** A lagged value of generosity is again included. Societal health depends both on the health system in a country and the economic development of a country. Following several studies (Lee, 2018; Kim & Kawachi, 2006), the main factor that represents the health system is public expenditure on health and factors that proxy for the level of economic development are (public expenditure on) education, GDP per capita, income inequality (and income transfers), poverty and unemployment. So, most of the controlling variables that Christoforou uses can stay in this model. The health dimension is also researched with a Fixed Effects Model, a Random Effects Model and a cross-sectional OLS model.

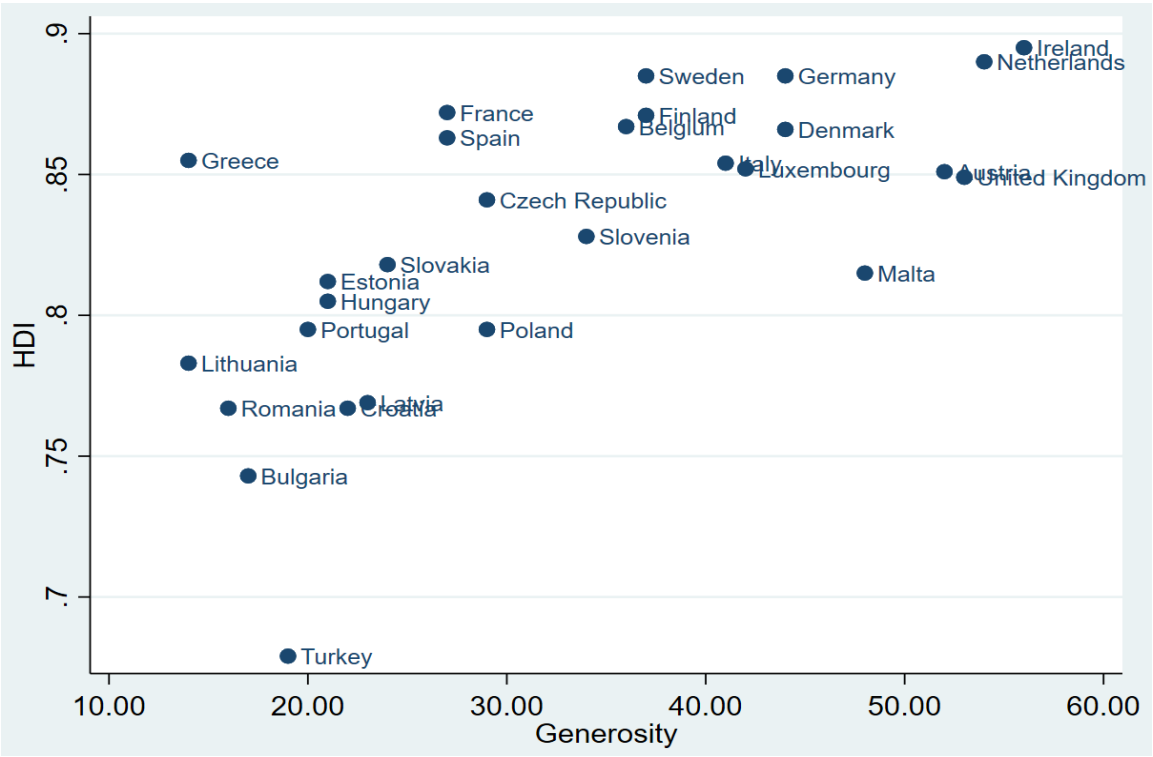
6. Results

In this chapter, the results of the different analyses are widely discussed. The relation between generosity and human development is addressed in section 6.1. The two dimensions of human development, which are the standard of living dimension (in the form of GNI) and the health dimension (in the form of life expectancy), are covered in sections 6.2 and 6.3. Afterwards, these results are linked back to human development in 6.4. In 6.5, we try to say something about the direction of the possible relationship between generosity and human development and in section 6.6 the countries with the highest variation in the explanatory variables are used as a subset for analysis in order to see if the results change.

6.1. Human development

Regarding human development, the expectation is that generosity has a positive effect on human development as formulated in hypothesis 1. A first look at the data shows a correlation of 0.72 between generosity and the HDI for all countries using the data of all years, which implies quite a strong positive correlation.[4] This positive correlation can also be seen in the following scatterplot for 2010:

Figure 1: Relationship between generosity and HDI for 2010



There are large differences in generosity between the different countries while the HDI levels are relatively closer. From separate scatterplots for the years 2010 to 2015,[5] it can be seen that the positive correlation holds and that the composition of countries doesn't change much per year,

[4] A full correlation matrix for all explanatory variables and all dependent variables can be found in Appendix B. Correlations that are mentioned later on can also be found in this matrix.

[5] Shown in Appendix C.

which means that there are no large changes in either generosity or the HDI within countries over time. The five countries with the highest average level of generosity are Ireland, the United Kingdom, the Netherlands, Malta and Austria. The five countries with the highest HDI are Ireland, the Netherlands, Germany, Denmark and Sweden. The HDI is slightly lower for Austria and the United Kingdom but still among the highest.[6] Thus, the countries with the highest levels of generosity are also those with the highest or very high levels of HDI.

As mentioned in section 5.1, we start with estimations without any control variables. If we run the FE, RE and cross-sectional OLS regressions with the HDI as dependent variable, either generosity or the three components of generosity as explanatory variables, their lagged values, and without control variables, the following results are obtained.[7] When only generosity is in the model, it shows a positive and statistically significant relationship with HDI in the RE model. This holds when its one-year lagged value is added, which in turn is also statistically significant and positive. In the OLS model, both generosity and general trust are significant and positive. Regarding the generosity components, donating is negative and significant in the FE model, but when its lagged value is added, this one is significant while the former becomes insignificant, suggesting that it is actually the lagged value that influences HDI and not the current value. However, no significant effects are found in the RE models. When it comes to volunteering, the models show some consistency. Volunteering has a positive coefficient in all models and is significant in both RE models and in the OLS model. Its lagged value is never significant. Helping a stranger is positive and significant in both the FE and RE model, but becomes insignificant when its lagged value is added. However, the lagged value is significant, which suggests that its not the current value but the lagged value that affects HDI, just like with donating.

If we now add all control variables, it can be seen (in table 1) that neither generosity nor the first lag has a significant effect in the FE model (model **(1)**). Generosity does have a positive significant effect in the RE model (model **(2)**), which is similar to the models without controls, although the coefficients and the significance levels have become smaller. Now, a 1 percentage point increase in the WGI increases the HDI with 0.0006 (recall that the HDI is a continuous variable with numbers between 0 and 1). A Hausman test shows that the hypothesis that there is no systematic difference in coefficients between the RE Model and the FE model cannot be rejected ($p = 0.0687$). In that case both estimations should produce coefficients that are similar and the RE model might even be preferable.

When the generosity variable is split into its three components, the correlations are 0.64, 0.74 and 0.60 between HDI and donating, volunteering and helping a stranger respectively. This means that any relation between HDI and overall generosity would mostly be through volunteering while donating and helping a stranger are less related to human development. As already stated, volunteering does show positive significance in the control-less models. However, from the regressions with controls, we see that in the FE model the donating, volunteering and helping a stranger variables are all insignificant (model **(3)**). These variables are also not jointly significant. However, the lagged donating variable is significant at the 1% level and negative while the lagged variables of volunteering and helping a stranger are positive but insignificant. The positive effects of lagged volunteering and helping might not be big enough to influence the HDI significantly but together they could offset the negative significant effect of lagged donating which would explain why

[6] A complete list of the most important data per country is given in Appendix D.
[7] All regression outputs regarding models without control variables are displayed in Appendix E.

the lagged generosity variable in model **(1)** is insignificant (but still negative due to the significant negative effect of lagged donating).

A Hausman test shows that the RE model should be used here as well (p = 0.5308). In the RE model (model **(4)**) volunteering becomes significant at the 10% level which only implies a weak relationship, if any at all. If there is indeed a relationship with HDI then it also impossible to tell whether volunteering influences human development or if it's the other way around. Even though volunteering becomes significant, donating and helping a stranger stay insignificant. However, the sum of the positive effects of volunteering and helping a stranger could explain why the generosity variable in regression **(2)** is significant since they easily outweigh the negative effect of donating (which is practically zero in this estimation). Furthermore, the lagged donating variable has decreased in size and is only significant at the 10% level. On the other hand, the lagged helping variable has become significant. Since the sizes of these two variables are similar and the volunteering variable has a size of zero, they seem to cancel each other out which would explain why the lagged variable of generosity in estimation **(2)** is slightly positive but insignificant.

Since the lagged variables precede the HDI outcome variable it seems at first glance that donating and helping a stranger might have an effect on HDI in a later year, where the former has a negative effect and the latter a positive effect. Because of these opposite directions (and because lagged volunteering seems to have no effect), the effect of overall lagged generosity is either negative if the effect of donating outweighs the effect of helping or positive if it's the other way around. In any case, the overall effect is insignificant due to these opposite effects.

The most interesting observation is that the effect of donating or lagged donating on HDI is always negative, whether it is significant or not. The expectation was that donating money would give the donator a good feeling (the warm-glow effect) and the money could be used to help those that need it. The HDI would then be increased through better health for the giver and a better standard of living, better opportunities to learn and better health for those who receive the donation. However, there are several reasons why this effect could indeed be negative. The following three reasons explain how donating could affect human development negatively through economic output. Firstly, charitable organizations don't always make efficient use of the donations they receive, so those who need the money don't actually receive all of it (Hyndman & McConville, 2016). Secondly, a part of the donations doesn't even end up with the charity but is retained by fundraisers (Charities Bureau, 2018). Thirdly, the receiver is often not in the same country as the giver. Charitable organizations often try to help people in third-world countries or in countries where a (natural) disaster took place. Only the warm-glow effect in the giver remains, which means that the effect of giving on the HDI in the country of the giver is significantly lower than in the case that the recipient would be in the same country (but it might increase the HDI of the receiving country). The remaining effect could even become negative if the loss of monetary funds is larger than the positive warm-glow effect of giving. However, how much money or resources flow to other countries is unclear. It is also possible that donating affects human development negatively through the health dimension. The most likely explanation for this is that there is buyer's remorse. In the traditional sense, buyer's remorse is the regret or guilt that a customer feels after having made a specific purchase (Friedman, 2012). Likewise, a donator can feel regret after having made a donation. We can call this donator's remorse. At the moment of donating the giver might indeed get a good feeling because he thinks he performed a good deed and is helping others. However, he could come to regret the donation for

any reason. Maybe he later realises that he would have rather spent the money on something else or if the donation is in the form of material goods (e.g. clothes or books), the donator could regret giving away specific belongings. Secondly, people who give money could feel forced to do so. Charities often send solicitors to people's houses. A couple of studies find that up to around 85% of donations are done following a solicitation and that solicitations greatly enhance the likelihood that people donate (Bekkers 2005; Bryant, Slaughter, Kang & Tax, 2003). Solicitors have a number of effective strategies at their disposal to make donators comply with their donation requests (Shearman & Yoo, 2007). These studies are about showing that solicitors are able to extract funds from potential donators, but they fail to take into account any possible negative effects that the solicitors might inflict on those that do donate. People are being persuaded to donate while they were not planning to do so initially. Even though the donator will probably still feel a bit good because he performed a nice deed, the loss of money and the feeling of having done something that he didn't actually want to do could outweigh the warm-glow effect of giving. This feeling can have a negative effect instantly but also contribute to the remorse in a later period. Thirdly, inherent to donating is that chances are high that the giver never gets to witness the fruits of his generous action, even if the recipient does live in the same country. Charities use the donation for good but the donator doesn't know in what way or who the recipient is. He also doesn't know if the recipient is actually made better off nor by how much if he is. The charity could provide some clarity on this, but they are often not transparent (Hyndman & McConville, 2016). The donator could then feel like his donation didn't have any positive results and that he actually didn't help anyone. The warm-glow effect would be completely counteracted. Not only that, he could also feel like he waisted money. Then he starts to regret his decision and starts feeling worse than before (i.e. this also adds to donator's remorse). This impacts his emotional health and thus his general health negatively. Furthermore, donating money typically doesn't take a lot of effort so any warm-glow giving effect that arises is likely to not be that big. That makes it easier for any of the mentioned negative effects to outweigh this positive effect of donating. The timing also makes sense since buyer's remorse is a phenomenon that comes to the surface in a later time period than the action itself, which would explain the negative coefficient of lagged donating. The negative effect of current donating can also be explained if the direct feeling of being forced to donate outweighs the (small) warm-glow effect.

Unlike with donating money, someone who volunteers or helps a stranger is more likely to see the direct effects of his charitable actions. Furthermore, volunteering or helping a stranger often takes more effort which results in a more satisfied feeling and it is also more likely that the beneficiary of the charitable actions is located in the same country as the performer. This could explain why the effects of volunteering and helping a stranger are positive. However, with volunteering through an organization, efficiency issues may again arise and it is also less likely that the giver will see the effects of his actions compared to helping a stranger directly. This might explain why the effects of helping a stranger are larger and more often significant than the effects of volunteering.

All in all, the effects on the receiving end could be mitigated (through the standard of living dimension) due to the charity not using the funds efficiently and could become negative due to funds flowing to another country if the receiver does not live in the same country as the donator. The effects on the giver could also be negative (through the health dimension) if the cost of donating is higher (because of feeling forced to donate money or feeling remorse later on) than the positive warm-glow effect. It seems not far-fetched that these added up costs actually outweigh the benefits and that we therefore see a negative relation between donating and human development.

Another surprising result is the size of the constant in both FE models. These are 0.9770 and 0.9923 respectively. This means that if all explanatory variables are at level zero, the HDI is either 0.9770 or 0.9923. These numbers are unrealistically high since the highest level the HDI can obtain is 1.00 and no single country has HDI levels like this. The size of the constant in the RE models, which are 0.8733 and 0.8759, make way more sense. The RE models seem, in accordance with the Hausman test, like the better models compared to the FE models.

When it comes to the control variables, the panel estimations show at first sight some counterintuitive results regarding the control variables since the growth rate of GDP per capita, credit provided by banks and political stability all show a significant negative effect on HDI. Especially in the FE models, this is probably due to the overestimated size of the constant. For instance, the highly significant negative coefficient of GDP per capita growth in the FE models becomes insignificant in the RE models. Furthermore, the negative significant effect of credit provided by banks becomes less significant and the negative effect of political stability becomes smaller when moving from the FE models to the RE models. Lastly, the quality of governance becomes significant and positive which was also expected. All in all, there is a lot speaking for the RE models as being the better models. There probably is too little variation in the panel dataset over time to provide good results in the FE models, as was feared already. Lastly, about the control variables, poverty has a strong negative and significant effect in all four panel models which also makes sense.

Next, we take a look at the cross-country estimations. Firstly, we see that general trust is significant at the 5% level in both models **(5)** and **(6)**, which was expected. This is a bit different from Christoforou's results. She finds a positive but insignificant effect. However, she did also expect a positive relationship. Even with the addition of general trust, generosity is still significant, although only at the 10% level. We again see in model **(6)** that the effect of donating is negative, but insignificant, the effect of volunteering is close to zero and insignificant, and the effect of helping a stranger is slightly significant and positive. This last effect also easily outweighs the negative effect of donating, which explains the positive and (weakly) significant effect of overall generosity in model **(5)**.

Now the control variables also make more sense than in all the panel data analyses. The coefficients of the growth rate of GDP per capita are now positive (although insignificant), the negative effect of credit provided by banks is still there but now insignificant or significant at only the 10% level, the negative effect of political stability is not significant anymore, poverty stays significant and negative and public expenditure on health now shows a significant positive effect which was also expected.

Lastly, we have to take each estimation method's problems into account. The FE models probably contain too little variation in the explanatory variables of interest, which could explain why the constants are so unrealistically high and some of the control variables have unexpected effects. If this really distorts the findings so much, the found effects for the generosity and its components might also not be reliable. When we move to the RE model, we see that generosity becomes significant but since it isn't significant in the FE models this might mean that the generosity variable in the RE model actually captures the effects of some country-specific time-invariant factors like the relationship between the government and the charitable organizations, and the history and culture of a country, as explained in section 5.1 (see also section 2.1.3.2). If that is the case and these results are in fact true, then generosity is endogenous and there is a correlation between generosity and human

development but no causal relationship. From the cross-country analyses we also can't derive a causal relationship. Not only are the results less strong but since there is no time factor involved the effects are correlations at most.

Table 1: Estimates of the effect of generosity on the Human Development Index

Dependent variable: HDI	(1) FE	(2) RE	(3) FE	(4) RE	(5) OLS	(6) OLS
Constant	0.9770***	0.8733***	0.9923***	0.8759***	0.7376***	0.6911***
	(0.0530)	(0.0352)	(0.0539)	(0.0356)	(0.1067)	(0.1090)
Generosity	0.0002	0.0006**			0.0015*	
	(0.0003)	(0.0002)			(0.0007)	
Generosity lag 1	-0.0004	0.0001				
	(0.0003)	(0.0003)				
Donating			-0.0002	-0.0000		-0.0006
			(0.0002)	(0.0002)		(0.0008)
Donating lag 1			-0.0005***	-0.0003*		
			(0.0002)	(0.0002)		
Volunteering			0.0002	0.0006*		0.0001
			(0.0004)	(0.0004)		(0.0008)
Volunteering lag 1			0.0001	0.0000		
			(0.0004)	(0.0004)		
Helping a stranger			0.0003	0.0002		0.0026*
			(0.0002)	(0.0002)		(0.0011)
Helping a stranger lag 1			0.0001	0.0005**		
			(0.0002)	(0.0002)		
General trust					0.0014**	0.0015**
					(0.0006)	(0.0005)
Adjusted R^2					0.89	0.90
F statistic	5.85	8.89	5.48	7.42	13.12	14.08
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]

Regressions with the HDI as dependent variable. Regressions (1), (2) and (5) include generosity and its one-year lagged value as explanatory variables while regressions (3), (4) and (6) contain the components of generosity and their one-year lagged values as explanatory variables. Regressions (5) and (6), which are the cross-sectional OLS models, contain general trust as additional explanatory variable. Regressions (1) and (3) include country-specific fixed effects. All regressions include the following set of controls: public expenditure on health, public expenditure on education, subsidies and other transfers, total R&D expenditure, growth rate of GDP per capita, international trade, credit provided by banks, stock market capitalisation, liquid liabilities to GDP, income inequality, poverty, unemployment, quality of governance, political stability and corruption. Standard errors are in parentheses. Probabilities are in brackets.

* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

6.2. Economic output

Now, we take a look at one of the three dimensions of human development, namely the standard of living dimension, which basically represents the economic well-being of a country and its residents. The dependent variable in these regressions is the Gross National Income per capita since this is one of the components that make up the HDI. First of all, the correlation between generosity and GNI per capita is 0.69, stating a fairly strong positive relation. Donating, volunteering and helping a stranger also have positive correlations with GNI, although these are mostly smaller than the correlation between generosity and GNI per capita: 0.66, 0.69, 0.51 respectively.

When looking at the regressions that include controls (see table 2), however, the first thing we notice is that overall generosity has a highly significant and negative effect on GNI, instead of positive, in both the FE and RE models **(7)** and **(8)** (which corresponds to the findings in the models without controls that include the lagged value of generosity). This is probably due to the large negative and significant coefficients of donating in models **(9)** and **(10)** and the insignificance of volunteering and helping a stranger in these models (although this explanation doesn't hold for the control-less models in which these coefficients may be negative but are not or just slightly significant). The negative effects of donating are in accordance with the findings in the previous section. Donating money implies a monetary setback for those that donate while the receiving end could be situated in another country or it could take time before the charities' actions pay off (e.g. a medical charity that raises money for research which would only pay off far in the future or a charity that builds houses or schools for people in need which takes time). Because of these factors, it seems logical that overall income diminishes in the year that donations are made.

Interestingly, the lagged value of generosity is negative and insignificant in the FE model but positive and significant in the RE model. This is also largely because of the lagged donating variable. In the FE model this variable is positive but insignificant while the lagged values of volunteering and helping a stranger are negative and insignificant, making the total effect of generosity negative and insignificant. In the RE model, however, the lagged value of donating is positive and significant. The lagged values of volunteering and helping a stranger stay insignificant, although the helping coefficient changes from negative to positive. The added-up effect of these three is then positive and significant which we can see in model **(8)** and in model **(10)** since these three lagged variables are jointly significant ($p = 0.0321$). These results largely correspond to those from the models excluding control variables.

That volunteering and helping a stranger don't have any significant effect is intuitively logical. These acts of generosity generally don't typically involve monetary measures. Volunteering to collect money or helping in a soup kitchen or helping an old woman cross the street don't cost the giver any money and it also doesn't give the receiver any. At most, it costs the giver time which he could have used to do something else. In this sense, there are opportunity costs which could lower overall productivity. This is also in line with the fact that most coefficients of (lagged) volunteering and helping a stranger are negative. However, these effects remain insignificant.

At first thought, the most surprising result of these estimations is the positive sign of lagged donating, since this is negative in the human development models. However, if you think about it, donating reduces one's income now but it could be a societal investment for the future, as already described above. It provides charitable foundations with funds to do good (even though they don't

always use the funds efficiently and some of the donations are retained by fundraisers). Recipients of the charities' help could get back up on their feet and become productive members of society. However, these effects take time and the impact of course depends again on the leakage of the effects to other countries. Hausman tests show that both FE models are more appropriate than the RE models (p = 0.0008 and 0.0067). In that case, the positive effect of lagged donating is not even significant.

Regarding the control variables, the lagged value of GNI per capita (the convergence to the steady state variable) is positive and significant in all panel data estimations. This makes sense since the GNI per capita in a particular year doesn't differ much from the year before. Inflation also has a significant effect in all models but this one is negative. Higher inflation is said to increase uncertainty and discourage investments in capital accumulation (Bassanini & Scarpetta, 2001) which would explain the negative sign. The last control variable that is significant in some models is R&D expenditure, although it is only significant at the 10% level and only in the RE models. Still, the positive relationship is in line with expectations.

Next, we take a look at the cross-sectional models. We can see that neither generosity nor its components have significant coefficients in models **(11)** and **(12)**. Surprisingly, neither does general trust. This coefficient is positive though. Similarly, Christoforou found a positive but statistically insignificant effect of general trust on human development and provided the possible explanation that human development could depend less on attitudes and sentiments of generalized trust and more on the capacity of members of social groups to organize, cooperate and set goals to fulfill development objectives (Christoforou, 2010). Although she offered this explanation for the insignificant relationship between general trust and human development, this reasoning might also be valid to describe the non-significant relationship between general trust and economic productivity since performing mutually beneficial collective actions might depend more on the ability of people to organize, cooperate and set goals to fulfill productivity objectives than on general trust.

Getting back to the explanatory variables of interest, in model **(11)** generosity and general trust are also not jointly significant and neither are donating, volunteering and helping a stranger in model **(12)** nor are donating, volunteering, helping a stranger and general trust. When only generosity or its components are included in the model without the inclusion of general trust (results are not shown), generosity and its components are still not significant. This doesn't only imply that generous behaviour doesn't influence GNI but also that general trust is not the actual channel through which generosity influences economic output as was hypothesized (hypothesis 2).

Table 2: Estimates of the effect of generosity on Gross National Income

Dependent variable: GNI	(7) FE	(8) RE	(9) FE	(10) RE	(11) OLS	(12) OLS
Constant	11.3609***	9.4409***	10.9164***	9.4733***	8.9551***	9.2150***
	(0.9369)	(0.3611)	(0.9642)	(0.4045)	(1.9025)	(2.418)
Generosity	-0.1190***	-0.0692***			0.0851	
	(0.0271)	(0.0239)			(0.1385)	
Generosity lag 1	-0.0193	0.0660***				
	(0.0300)	(0.0254)				
Donating			-0.0648***	-0.0438**		-0.0008
			(0.0186)	(0.0176)		(0.0052)
Donating lag 1			0.0052	0.0365**		
			(0.0181)	(0.0164)		
Volunteering			-0.0200	0.0165		0.0082
			(0.0196)	(0.0177)		(0.0075)
Volunteering lag 1			-0.0196	-0.0034		
			(0.0194)	(0.0189)		
Helping a stranger			-0.0022	-0.0370		-0.0011
			(0.0367)	(0.0361)		(0.0116)
Helping a stranger lag 1			-0.0007	0.0271		
			(0.0374)	(0.0365)		
General trust					0.2228	0.2273
					(0.1474)	(0.1548)
Adjusted R^2					0.83	0.82
F statistic	10.06	66.30	8.18	55.40	11.49	9.42
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]

Regressions with GNI per capita as dependent variable. Regressions (7), (8) and (11) include generosity and its one-year lagged value as explanatory variables while regressions (9), (10) and (12) contain the components of generosity and their one-year lagged values as explanatory variables. Regressions (11) and (12), which are the cross-sectional OLS models, contain general trust as additional explanatory variable. Regressions (7) and (9) include country-specific fixed effects. All regressions include the following set of controls: one-year lagged value of GNI, gross fixed capital formation, mean years of schooling, population growth, total R&D expenditure, inflation, inflation variability, government consumption expenditure, international trade, credit provided by banks, stock market capitalisation and liquid liabilities to GDP. Standard errors are in parentheses. Probabilities are in brackets. Note: all variables have been logarithmically transformed.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

This finding is backed up by the results of regression **(13)** (see table 3) which show that generosity does not have a significant effect on general trust. Higher levels of trust are mainly explained by whether people think others would try to act fair. However, this relationship could also be reverse. When this variable and the other control variables are left out of the model, generosity does become statistically significant and positive at the 1% level. When they are added again, other factors that contribute positively to general trust are confidence in the justice system and thinking that leisure time for rest is important. Although these coefficients are insignificant, their magnitudes are more

than 200 times bigger than the coefficient of generosity, which shows how insignificant generosity probably is. Interestingly, the only other significant coefficient is that of leisure time for learning which is actually negative. This variable represents how important people think it is to have leisure time for learning which logically should correspond to actual time spent on learning. People who spend more time on learning might forego social interactions since learning is often done by oneself. This lack of social interactions might lower general trust levels. On the other side, people who spend more time relaxing might do so by hanging out with friends and doing other social activities which could attribute positively to trust levels (although not significantly in this model). The last interesting result of this model is the negative constant. This means that if all other factors are equal to zero, there would be a negative level of trust. This might mean that people are intrinsically distrusting and careful when they are without any knowledge about others they interact with. However, the constant is not statistically significant so it's impossible to say whether this is indeed the case.

Table 3: Estimates of the effect of generosity on general trust

Dependent variable: general trust	(13) OLS
Constant	-27.1368 (46.8587)
Generosity	0.0326 (0.1897)
Fairness	11.6463*** (2.9356)
Confidence in justice system	8.937 (5.7712)
Leisure time for rest	15.3704 (14.4321)
Leisure time for learning	-25.9627*** (7.4126)
Adjusted R^2	0.83
F statistic	27.40 [0.00]

Cross-sectional OLS regression of general trust on generosity. The regression includes fairness, confidence in the justice system, leisure time for rest and leisure time for learning as control variables. Standard errors are in parentheses. Probabilities are in brackets.
* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

That generous behaviour does not affect general trust is a very important finding since this basically debunks the theory that generosity increases economic output through the facilitation of MCBA. That also explains why the found coefficients of volunteering and helping a stranger in the GNI panel data models lack significance, since these are the two components of generosity that would most likely influence societal trust.

All in all, there seems to be some evidence that generosity has a significant relationship with economic output and that this effect depends on the effect of donating. Current donating and hence

generosity seem to have negative effects due to the loss of monetary resources to other countries and the time differential between charities receiving the donations and using them for good. This latter effect could also explain why the effect of lagged donating is indeed positive in the RE model. In some cases, the large significant effect of (lagged) donating is big enough to offset the insignificant effects of volunteering and helping a stranger, hence making the overall generosity variable also significant. That the effects of volunteering and helping a stranger are insignificant make sense since they don't seem to increase trust in society, so any positive effects would just be individual effects. Although volunteering and helping a stranger could help individual others in such a way that makes them more productive for society and this often doesn't involve monetary costs, the giver does incur opportunity costs since this time could have been spent otherwise. These individual effects are therefore ambiguous and their aggregated effect on society insignificant.

We do have to keep in mind the problems of the different estimation methods. While the RE models show a significant coefficient of lagged generosity and lagged donating, the FE models do not. This means that there could be one or multiple country-specific time-invariant factors that could explain the relationship between lagged generosity or lagged donating and economic output. On the other hand, since the FE model only uses within-country variation, there probably isn't enough variation to base solid conclusions on. However, since both models show a significant negative relationship between current generosity and GNI and between current donating and GNI, this association already seems more likely to hold. Still, in that case we cannot say anything about the direction of this effect. Although it sounds more plausible that donating money lowers economic output through the stated effects than that higher GNI lowers donations, there is no statistical evidence for this.

6.3. Health

Hypothesis 3 reads: ***generosity (and especially volunteering) leads to longer life expectancy at birth.*** To start, the correlations between life expectancy and overall generosity, donating, volunteering and helping a stranger are 0.62, 0.56, 0.62 and 0.54. Once again, the component of generosity that has (about) the same correlation with the dependent variable as overall generosity itself is volunteering, while the other two show weaker relations with the dependent variable.

When moving to the regressions (see table 4), both the current and the lagged generosity variables don't show significant effects in the panel data models (models **(14)** and **(15)**). Although the current generosity coefficient is statistically significant in the RE model, this significance is only at the 10% level. When we break down this effect, we see that only the current helping of a stranger is significant in the FE model **(16)**, but also only at the 10% level.

The lagged values of the generosity components are more interesting. In both the FE and RE model lagged helping is strongly significant and positive (models **(16)** and **(17)**. Since it is the lagged variable that has a significant effect and not the current value, this provides some evidence for the notion that helping a stranger actually affects life expectancy instead of the other way around. Interestingly, it's helping a stranger that has significant coefficients and not volunteering although that was the expectation. Maybe the effort that goes into volunteering puts too much of a strain on people compared to small and easy to complete acts of helping a stranger. As mentioned before, Musick, Herzog and House (1999) find that the costs of volunteering can outweigh the benefits if it becomes too much. Alas, the WGI data does not contain the number of hours spent volunteering so it's impossible to research whether that's the reason that volunteering doesn't have a significant effect.

Anyway, it does seem plausible that performing a generous act in the form of volunteering actually provides the giver with similar benefits as helping a stranger but that the costs in the form of a higher workload are higher in the former situation than in the latter. The net benefits of helping a stranger are then larger than those of volunteering which could explain the significant effect of the former and the insignificant effect of the latter.

Next, we move to lagged donating which is significant and negative in both models **(16)** and **(17)**. The initial theory was that donating is supposed to have a warm-glow effect and give the donator a good feeling, hence increasing his emotional well-being and thus his general health and life expectancy. However, it could be that there is donator's remorse and that this negative feeling is larger than the (small) warm-glow giving effect that comes with donating, as discussed in section 6.1. The insignificance of current donating also makes sense, because it is likely that the positive warm-glow giving effect and the current negative feeling of feeling forced to donate (which is smaller than the feeling of remorse later on) negate each other, leaving the overall effect ambiguous.

Since volunteering doesn't really have any effect, the average effect of lagged generosity is decided by lagged donating and lagged helping a stranger. In the FE model **(16)**, both coefficients are highly significant but because of their opposite signs, they work against each other. The result is a positive but insignificant coefficient of generosity in model **(14)**. In the RE model **(17)**, the coefficient of lagged donating is smaller and less significant than in the FE model, while there are only small changes in the coefficient of lagged helping, resulting in a larger aggregated positive, albeit still insignificant, coefficient of lagged generosity in model **(15)**. Interestingly, current generosity in model **(15)** is significant at the 10% level even though none of the generosity components is significant by itself in model **(17)**. This might be due to the coefficient of donating being positive instead of negative like in the FE model **(16)**.

According to Hausman tests, the two FE models should be more appropriate than the two RE models ($p = 0.0000$ and $p = 0.0054$). If that is the case, donating would have a significant negative association with future life expectancy and helping a stranger a significant positive one. Together they would offset each other, making the total effect of generosity insignificant. Taking the control variables in mind, then the RE models actually make more sense. In the FE models, public expenditure on health has a negative and insignificant relationship with health while there is actually a broad consensus that this is the main driver of societal health in a country. In the RE models this variable does have the expected effect which is positive and significant. Furthermore, GDP per capita is insignificant in the FE models, but significant in the RE models. The RE results are more logical since people in wealthier countries tend to be healthier as well. The same goes for poverty which is insignificant in the FE models but significant in the RE models. Interestingly, unemployment also becomes significant when switching. It could be that people who lose their jobs also lose the stress that comes with it while still receiving public benefits from the government. Hence, the income loss is not big enough to impact health. Lastly, mean years of schooling is positive and significant in all panel data models which also makes sense because people that study longer tend to earn more money and are able to acquire better healthcare. To round up, when looking at the intuitively logical effects of the control variables, the RE models seem to be the better choice, even though the Hausman tests say differently. In that case, the effect of lagged helping a stranger is still positive and highly significant but the effect of lagged donating becomes less significant, although it does remain negative.

The RE models might also be better if you take into account the problems that both models have. The FE models are probably based on too little variation which could distort some of the effects of the control variables (note that most differences are in size and significance levels but not in direction). On the other hand, since both the FE and RE models show similar results regarding generosity and its components, it seems that the relationships between these variables and health does not depend on country-specific time-invariant factors. Hence, the main downside of the RE models might not even be a problem in this situation.

The results of the RE models **(15)** and **(17)**, regarding the current values, also correspond to those of the cross-sectional models **(18)** and **(19)**. The aggregate generosity effect is positive and significant (even more so in the OLS model), all coefficients of the three components are positive but also statistically insignificant. Almost all control variables show similar results as well. Similar to before, helping a stranger has the biggest coefficient of the three components.

In conclusion, it seems like if there is any positive effect of generosity on health it's through helping a stranger. Since these acts take little effort but provide relatively large benefits (for both the giver in the form of the warm-glow effect and the recipient who gets helped), the net effect seems to be positive. Volunteering, however, comes with similar benefits but likely higher costs, making the net effect insignificant. Regarding donating, the effect of current donating on health is insignificant, and in some models negative and others positive. There are two forces at work here that could explain this. On the one hand, the donator could get a positive feeling which makes him happier and could increase his health but on the other side, donating could feel forced as explained above and in section 6.1. Depending on which effect is bigger, the overall effect would be either negative or positive. The most important thing to note is that even if the positive feeling strongly outweighs the negative one, this still doesn't mean that the warm-glow effect is big enough to significantly enhance one's health. Donating only takes a low amount of effort and the donator is probably not even able to see the direct effects of his donation. The found insignificant positive effects are therefore not illogical. On the other hand, helping a stranger also doesn't have to involve a lot of effort but probably more than donating money and one can see the effects of helping someone directly. People are then more likely to be left with a better feeling than they get from donating. This could explain the larger and significant effects of helping a stranger compared to donating.

Coming back to the two opposite effects surrounding donating, the negative effect is also likely to gain ground on the positive effect as time passes. While someone might feel good directly after donating, he could later come to the realization that he never found out about what actually happened with his money and the feeling of being forced to donate could evolve into a feeling of remorse. The feeling of having helped someone vanishes and the donation might feel like a waste. The positive warm-glow effect turns into a negative effect. This could explain why the lagged value of donating is significantly negative. Regarding the helping a stranger variable, if helping does have a positive effect on one's emotional well-being and health, it would be logical that helping someone now would increase future life expectancy. However, since the impact would be quite instantly (since you get the warm-glow effect directly after helping and you also see the effect of your helping directly), a positive and significant relationship would also be expected between helping and health and not just for next period. This particular result is missing though.

Table 4: Estimates of the effect of generosity on life expectancy

Dependent variable: Life expectancy	(14) FE	(15) RE	(16) FE	(17) RE	(18) OLS	(19) OLS
Constant	71.8275*** (2.6248)	69.2690*** (2.2018)	72.4715*** (2.5783)	69.7844*** (2.1872)	84.2599*** (5.825)	84.6055*** (6.1780)
Generosity	0.0160 (0.0137)	0.0243* (0.0139)			0.0765** (0.0361)	
Generosity lag 1	0.0135 (0.0154)	0.0230 (0.0154)				
Donating			-0.0002 (0.0096)	0.0026 (0.0104)		0.0195 (0.0317)
Donating lag 1			-0.0251*** (0.0091)	-0.0158* (0.0096)		
Volunteering			-0.0173 (0.0200)	0.0039 (0.0216)		0.0104 (0.0548)
Volunteering lag 1			-0.0215 (0.0203)	-0.0121 (0.0220)		
Helping a stranger			0.0209* (0.0112)	0.0200 (0.0131)		0.0514 (0.0626)
Helping a stranger lag 1			0.0423*** (0.0118)	0.0446*** (0.0136)		
Adjusted R^2					0.81	0.79
F statistic	5.27 [0.00]	8.60 [0.00]	6.35 [0.00]	7.75 [0.00]	13.65 [0.00]	10.19 [0.00]

Regressions with life expectancy as dependent variable. Regressions (14), (15) and (18) include generosity and its one-year lagged value as explanatory variables while regressions (16), (17) and (19) contain the components of generosity and their one-year lagged values as explanatory variables. Regressions (14) and (16) include country-specific fixed effects. All regressions include the following set of controls: public expenditure on health, public expenditure on education, mean years of schooling, subsidies and other transfers, GDP per capita, income inequality, poverty and unemployment. Standard errors are in parentheses. Probabilities are in brackets.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

6.4. Revisiting human development

Let's sum up all the findings of the previous three sections and see if we can make sense of the different effects in connection with each other. The expectations were that generosity has a positive effect on economic output and that this would be materialized via higher levels of trust (hypothesis 2), that generosity leads to longer life expectancy at birth and that volunteering would be the most influential generous behaviour (hypothesis 3), and thus that generosity has a positive effect on human development through both the standard of living dimension and the health dimension (hypothesis 1).

We have seen in section 6.1 that if there is any relationship between generosity and human development it seems to be positive but not causal. This relationship is made up of a negative association between donating and human development and a positive one between helping a stranger and human development. Volunteering didn't seem to have any significant relation with human development at all.

So, are the aggregated results for the different dimensions of human development in line with these general findings? Let's first state that the sizes of the coefficients of the GNI models and of the life expectancy models cannot be averaged in a straightforward way, since the former is a logarithmically transformed model while the latter is not. The comparison is therefore mostly about the signs of the coefficients.

Firstly, we see that the regressions show that current donating has a significant negative association with GNI but an insignificant one with life expectancy. As previously discussed, the former relationship could be because donating leads to a direct decrease in monetary endowment without a direct positive effect on the economy and one's income (especially when funds leak to other countries) and the latter association could be explained by the idea that there is a positive effect of donating on a person's health (due to the warm-glow effect), but that this effect is actually quite small (due to the act of donating being a low effort act) and that this positive effect could be offset by the negative feeling of being forced to donate. While the effect of current donating on GNI seems to be significantly negative, the effect of current donating on human development is probably insignificant due to the insignificance of current donating in the life expectancy model, since the human development model shows the average effects of the other models. Thus, the found effect of current donating in the GNI and life expectancy models are in line with what is found in the HDI model.

Secondly, regarding the lagged values of donating, these are significant and negative in both the FE and RE human development model, albeit at the 1% level in the former and only at the 10% level in the latter model. Exactly the same holds for the life expectancy models. In the GNI models, lagged donating actually shows a positive effect, probably due to the fact that it takes time before donated funds result in more productivity, but it is insignificant in the FE model and significant (at the 5% level) in the RE model. The highly significant negative coefficient in the FE life expectancy model, probably because of donator's remorse, ensures the highly significant negative coefficient in the FE human development model, due to the effect on GNI being insignificant. Apparently, the former effect strongly outweighs the insignificant effect on GNI. When we look at the RE models, not only does the coefficient of lagged donating stay negative and become less significant in the life expectancy model, but it becomes statistically significant in the GNI model while it also stays positive.

Together, these changes explain why the aggregate effect in the human development model is also way less significant than in the FE model. However, since the aggregate effect is still negative, it again seems like the negative impact on health outweighs the positive impact on GNI. All in all, all results do correspond to each other.

Thirdly, the analyses show some evidence for a positive relationship between helping a stranger and life expectancy but there seems to be no significant association between helping a stranger and GNI. The average of the effects of lagged helping a stranger from the GNI and life expectancy models can explain the findings of the human development model. We see in the RE models that the lagged value of helping a stranger is positive and significant in the life expectancy model and positive and insignificant in the GNI model, resulting in a joint positive and significant coefficient in the human development model. In the FE models this coefficient is positive and significant in the life expectancy model but negative and insignificant in the GNI model, resulting in a positive but insignificant association in the human development model. So, even though lagged helping is insignificant in the GNI model, the sign of the effect is important for the significance of the overall effect on human development. According to these models, the lagged value of helping is at least significantly and positively related to generosity through the health dimension but this effect could be counteracted by the relationship between lagged helping and the standard of living dimension of human development, depending on what this last relationship actually is.

Now, let's turn to the effects of overall generosity because these aren't as in line with each other as the results concerning the components of generosity. Current generosity has a significant negative relationship with GNI and a positive insignificant one with life expectancy in the FE models. The association with human development is also positive and insignificant. It seems more logical that a strongly significant effect would outweigh an insignificant effect than the other way around. Hence, it doesn't make a lot of sense that the effect of generosity on human development is positive and insignificant while the effect on GNI is highly significantly negative and only insignificant but positive on health. If the effect on health would outweigh the effect on GNI, we would expect to see statistical significance, which we don't. The RE models show similar results. Here, the effect of generosity on GNI is again negative and highly significant but now the effect on life expectancy is barely significant (only at the 10% level) and positive and the effect on human development is again positive but even significant at the 5% level. Again, we would expect the highly significant negative effect to have the upper hand. However, as already stretched before, coefficient sizes are hard to compare due to the setup of the models so it could actually be possible that the positive effect of generosity on health is bigger in size than the negative effect on GNI even though the former shows no (or at least less) statistical significance while the latter shows high significance. It could also just be that any increase in health has a larger impact on human development than a similar increase in GNI. Furthermore, another effect could play a role because we are missing one of the human development components in this research, which is the education dimension. It could be that there is an unexpected positive link between generosity and education that makes the overall effect of generosity on human development more positive, although this seems unlikely. However, if this is indeed the case, this might also distort the already discussed results of the components of generosity, depending on which components would have a significant relationship with education. But if it, for instance, would be volunteering, then the previous results for donating and helping a stranger would still hold, while the differences for overall generosity could possibly be then explained.

The results for lagged generosity are even more puzzling. Just like with current generosity, the effect on GNI is negative and on life expectancy positive in the FE models. However, now they are both insignificant (instead of the negative effect on GNI being highly significant), but the effect on human development is suddenly negative instead of positive. If the just developed theory that the positive effect on life expectancy outweighs the negative effect on GNI in size would be true, we would expect to again see a positive sign in the human development model. Hence, the results between current and lagged generosity seem inconsistent. However, it is hard to make sense of insignificant coefficients and it could also be that the effects of current generosity and lagged generosity on education differ, if there is some surprising relationship at all between generosity and education. Furthermore, the effects of lagged generosity in the RE models are as follows. The relationship with GNI is positive and statistically significant, with health it is positive but insignificant and with human development it is also positive and insignificant. Now, if the effect of generosity on health has a relatively bigger impact on human development than the effect of generosity on GNI, these results make sense again. Then the significance of the coefficient of lagged generosity in the GNI model is negated by the insignificance of the coefficient in the life expectancy model and the average positive effect on human development is insignificant. So, this is in line with what is found in the models that contain the different components of generosity and the models with current generosity. The only results that don't match this theory are the lagged generosity coefficients in the FE models, but this could once again be because of a lack of data variation in these models.

A preliminary analysis can be performed to see whether the hypothesis that the influence of generosity through the health dimension on human development is larger than that through the standard of living dimension. A simple regression with the HDI as dependent variable and its components as explanatory variables shows that the effect of GNI on the HDI is by far the smallest (a 1% increase in GNI increases the HDI by about 0.0004) and that the effect of life expectancy is easily the largest (a 1% increase in life expectancy increases the HDI by around 0.0052).[8] This means that the impact of the health dimension on human development is circa 13 times as large as the influence of the standard of living dimension. Thus, it seems that the theory holds some promise, but more extensive research is necessary to provide more evidence and to see why this might be the case.

In sum, when it comes to the effects of generosity on human development, most results can be broken down into the effects that generosity and its components have on either GNI (the standard of living dimension of human development) or on life expectancy at birth (the health dimension of human development). Donating seems to have a negative relationship with both GNI and life expectancy while helping a stranger seems to have a positive effect on health and possibly on GNI. This renders the overall effect of generosity on human development ambiguous.

Next, we take a look at the cross-sectional models. Generosity has a positive and insignificant relationship with GNI and a positive and significant relationship with life expectancy, which results in an average positive but weakly significant relationship with overall human development (only significant at the 10% level). Regarding the components of generosity, the only found significant effect is that of helping a stranger on human development, although only at the 10% level. However, the coefficient of helping a stranger shows a negative sign in the GNI model and a positive sign in the health model while it is insignificant at both. The fact that helping a stranger is still weakly significant

[8] The results can be found in Appendix F. Both a FE and RE model are analyzed and the mentioned numbers are the average effects of these two models.

in the human development model despite its insignificance in the separated models is again in line with the thought that the impact via the health dimension on human development is bigger than that through the standard of living dimension.

More interesting to see in these models is that general trust does have a positive and significant relationship with human development, but a positive and insignificant association with economic output. Economic output is the main channel through which general trust was thought to have an effect on human development since higher levels of trust were hypothesized to facilitate more (efficient) coordination and cooperation (by reducing transaction costs and information asymmetries) and hence to help produce a larger total economic output through more mutually beneficial collective actions. It could be that general trust affects human development in another way or that the relationship is the other way around. Maybe people who have higher incomes, who are healthier and who have higher levels of education are more trusting because of these things. However general trust might relate to human development, it is most important to realise that generosity does not seem to influence human development through general trust, not through the standard of living dimension nor any other way (which follows from model **(13)**), but that trust is linked to human development in another manner.

6.5. Direction of the relationship

Until this point, only one-year lagged values of the explanatory variables have been used. It's also possible that it takes more time to see the effects of generosity on human development. In order to research this, a number of estimations have been performed that only include generosity and a number of its lagged values. Since the data spans over a period of 6 years, at maximum five-year lagged values can be used. However, using a five-year lagged value changes the panel dataset into a cross-sectional dataset since only information for one year remains. Because of this fundamental change in estimation method, only up until four-year lagged values are analyzed.[9]

When looking at the FE models, current generosity is significant at the 5% level in multiple models and the two-year lagged value is significant when all lagged values are included. However, no other lagged values are significant. Current generosity seems to have the strongest relationship with HDI. The RE models show a different story. Although all of these models show statistically significant positive relationships between HDI and current generosity, they also show significant relations between the different lags of generosity and HDI. Especially the generosity of two years prior seems to have a robust association with HDI.

If we flip the models and make generosity the dependent variable and the HDI and its lagged values the explanatory variables, we see no significant relationships in the FE models. In the RE models, generosity and current HDI always have a significant relation at either the 5% or 1% level. However, in none of the models do any of the lagged HDI values attain a significant coefficient. Combining this result with the ones found above, it seems that if there is any causal relationship between HDI and generosity, it is likely that it is generosity that influences HDI instead of the other way around.[10]

[9] All results can be found in Appendix G.

[10] Hausman tests show that the inclusion of fixed effects is preferred in the models with just generosity or just HDI and the models with the one-year lagged value of generosity or HDI, but that random effects are preferred in the models with multiple-year lagged values of generosity or HDI.

6.6. Robustness

One problem of the previous models is the lack of variation in the generosity variables. Therefore, as a robustness check, the same regressions are performed as before using the countries that show the most variation. These are the countries that have the largest standard deviations in the generosity variable. Only one country has a standard deviation larger than 7.0 (Croatia), one higher than 6.0 (Italy), two higher than 4.0 (Luxembourg and Portugal) and four higher than 3.0 (Austria, Czech Republic, Hungary and Poland). The other nineteen countries have smaller standard deviations.[11] The previous analyses are repeated for all eight countries with standard deviations larger than 3.0.[12] Lastly, using only this subset of countries results in collinearity problems when using the cross-sectional OLS models. Hence, only the FE and RE panel data models are discussed.[13]

Clearly, there are some differences in the outcomes of these models and those of the previous estimations. Firstly, neither generosity, its lagged value nor the components of generosity and their lagged values have significant coefficients in any of the regressions with HDI as dependent variable. Moving on to the GNI models, most results stay the same. In both the models with overall generosity, overall generosity still shows a significant and negative association with HDI. However, the lagged value of generosity in the RE model loses its significance. In both the estimations with the components of generosity, donating also keeps its significance and negative sign. The lagged value of donating loses its significance in the RE model, which probably explains why the lagged value of overall generosity did too. Lastly, regarding the life expectancy analyses, most statistically significant relations found before are gone now. The only one that remains (at the 5% level) is the lagged value of helping a stranger in the FE model. Then it also makes sense that the significance of the coefficients of the HDI models have vanished. There might be some relations between generosity (and its components) and GNI, but because there are barely any relations between generosity and life expectancy, the overall HDI is not significantly influenced.

The most likely explanation for the fact that some of these models did not pick up the same effects as the previous ones is the lack of data. By dropping most of the countries, only eight countries with in total forty observations remained. To check the robustness of the findings, the ideal scenario would be to use more data with plenty of variation in the explanatory variables within the countries over time.

[11] See Appendix H for a full list of standard deviations for all countries.

[12] An analysis of only the four countries with standard deviations higher than 4.0 was not possible because using only these countries resulted in too few datapoints for the statistical program to analyze when using multiple imputation.

[13] The results can be found in Appendix I.

7. Conclusion & Discussion

Social capital is seen more and more as a form of capital, next to both physical and human capital, that is important in influencing several economic variables. Many aspects of social capital have been investigated lately, but one has gone largely unresearched, which is generosity. Performing generous behaviour is part of one's civic engagement, which in turn is one of the components that make up social capital. The most frequently examined dependent variable is economic output or economic growth, but this doesn't always give a full picture of human development or welfare. Therefore, in this research, the relation between generosity and human development in the form of the Human Development Index has been studied.

Firstly, it was hypothesized that generosity has a positive relationship with economic output and that this works through general trust (hypothesis 2). However, the results show some evidence that generosity has a significant negative relation with economic output instead of positive. This is probably caused by one of the components of generosity, which is donating, whereas volunteering and helping a stranger don't seem to be related to economic output. Donating implies that one loses part of his money, which logically lowers GNI instantaneously. Whether these donations increase other's opportunities and overall productivity, and hence economic output, can depend on the percentage of funds that actually ends up with the charities (instead of with fundraisers), how the donations are being put to (productive and efficient) use, how long it takes for the charities to allocate these funds and whether these funds are even used in the same country as the donator originates from. If the funds aren't used productively or are transported to a different country, this decreases GNI, which would explain the found negative effect. If it takes some time for charities to use the funds, this would give an explanation for the found positive relation between the lagged value of donating and economic output. It would be interesting to compare the link between donating in one country and progress in receiving countries. Donating in one country could improve the HDI in other countries, while it decreases the HDI in the countries of origin. Regarding the insignificant associations between volunteering and helping a stranger on the one side and economic output on the other side, this makes sense since these components of generosity don't seem to increase trust in society, so any positive effects would just be individual effects. Although volunteering and helping a stranger could help individual others in such a way that makes them more productive for society and this often doesn't involve monetary costs, the giver does incur opportunity costs since this time could have been spent otherwise. These individual effects are therefore ambiguous and their aggregated effect on society insignificant. Furthermore, not only does generosity not increase levels of trust but the results also show that general trust does not influence economic output, which is not in line with theory and other studies. General trust does, however, still influence human development in the performed analyses, although it is unclear in what way.

Secondly, the expectation was that generosity positively influences life expectancy and that volunteering would be the most influential component of generosity (hypothesis 3). According to the estimation results, if there is any positive relationship between generosity and health, it would be because of the helping a stranger component. Helping a stranger can entail small acts of kindness that cost little effort but can create relatively large benefits. The helper may feel the warm-glow effect while the person who is being helped is obviously also better off due to the help. Volunteering, however, comes with similar benefits but likely also with higher (effort) costs, making the net effect insignificant. Regarding donating, multiple factors could be in play. Like with helping a stranger and

volunteering, donating could produce a warm-glow effect, but it is also possible that a donator could feel forced to give money. This renders the overall effect of current donating ambiguous. Whether these two opposite effects actually take place in real life would be interesting to explore. Furthermore, the possible inability of the donator to see the results of his good deed might decrease the benefits, at least in comparison to helping a stranger and volunteering, where the impact of the performed acts are more easily visible. This could induce the donator to feel remorse about his decision to donate. The feeling of being forced to donate could also add to this. Since this feeling of remorse is likely to strongly outweigh the (small) warm-glow giving effect of donating, the negative effect of lagged donating on health makes sense.

Overall, we see some negative and some positive relations between generosity and both economic output and life expectancy. Thus, there is some evidence for the hypothesis that generosity has a positive effect on human development through both the standard of living dimension and the health dimension (hypothesis 1). It looks like the estimations with HDI as dependent variable largely confirm the findings in the other models. Current donating seems to have some negative effect on economic output, lagged donating seems to have some positive effect on economic output but some negative effect on health, and helping a stranger seems to have some positive effect on health. According to these models, the aggregated effect of total generosity ends up being positive, although significant in the RE model **(2)** but insignificant in the FE model **(1)**. Even though the RE model seems like the better model (according to a Hausman test and because the size of the constant makes a lot more sense), the only conclusion that can be made is that there might be a significant positive relationship overall and even if there is, it is not clear whether this relationship is causal. It is tried in this study to at least shed some light on the direction of the relationship. If there is a causal relation it seems more likely that it is generosity that impacts human development than that human development affects generosity.

The inability of describing the relationship as causal is mostly due to generosity probably being an endogenous variable and the lack of variation in the explanatory variables. For future research, it should be found out whether a good instrumental variable can be found in order to perform an instrumental variables estimation as to deal with the endogeneity of generosity. Regarding the variation problem, the analyses have also been carried out for the subset of eight countries with the highest levels of variation in the explanatory variables. In this case, the negative relationship between donating and economic output remains but the other significant coefficients seem to disappear. However, this might be because of the loss of a substantial amount of data that occurred due to the dropping of most of the countries. More countries that show a considerable amount of variation in generosity over time are needed as well as more datapoints for these countries.

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Appendix A: List of used variables[14]

Human Development Index: summary measure of achievements in three key dimensions of human development which are a long and healthy life, access to and a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions which are the health index, education index (which in turn consists of the expected years of schooling index and the mean years of schooling index) and the income index. Klugman (2010, 2011), Malik (2013, 2014), Jahan (2015, 2016).

Mean years of schooling: average years of schooling of residents in a country. Klugman (2010, 2011), Malik (2013, 2014), Jahan (2015, 2016).

Life expectancy at birth: in years. Klugman (2010, 2011), Malik (2013, 2014), Jahan (2015, 2016).

Gross National Income: income per capita of an economy generated by its production and its ownership of factors of production minus the incomes paid for the use of factors of production owned by the rest of the world, converted to international dollars using 2011 purchasing power parity rates (2011 PPP $). United Nations Development Programme (2016a).[15]

Gross National Income lag 1: Gross National Income of the previous year. United Nations Development Programme (2016a).

Generosity: the average percentage of people that donated money, volunteered time or helped a stranger in the month before the survey took place. Charities Aid Foundation (2010, 2011, 2012, 2013, 2014, 2015).

Generosity lag 1: the average percentage of people that donated money, volunteered time or helped a stranger in the month before the survey of the previous year took place. Charities Aid Foundation (2010, 2011, 2012, 2013, 2014, 2015).

Donating: the percentage of people that donated money in the month before the survey took place. Charities Aid Foundation (2010, 2011, 2012, 2013, 2014, 2015).

Donating lag 1: the percentage of people that donated money in the month before the survey of the previous year took place. Charities Aid Foundation (2010, 2011, 2012, 2013, 2014, 2015).

Volunteering: the percentage of people that volunteered time in the month before the survey took place. Charities Aid Foundation (2010, 2011, 2012, 2013, 2014, 2015).

Volunteering lag 1: the percentage of people that volunteered time in the month before the survey of the previous year took place. Charities Aid Foundation (2010, 2011, 2012, 2013, 2014, 2015).

Helping a stranger: the percentage of people that helped a stranger in the month before the survey took place. Charities Aid Foundation (2010, 2011, 2012, 2013, 2014, 2015).

[14] The years that accompany the datasets represent the last year that the dataset has a datapoint for.

[15] This dataset has been updated after the analyses in this research had already been concluded. Not only was data for the years 2016 and 2017 added, but all previous data were changed as well. The used data stem from 2016 and can still be requested.

Helping a stranger lag 1: the percentage of people that helped a stranger in the month before the survey of the previous year took place. Charities Aid Foundation (2010, 2011, 2012, 2013, 2014, 2015).

General trust: percentage of respondents in each country claiming that, generally speaking, most people can be trusted, as opposed to stating that they cannot be too careful when dealing with other people. Year 2008. EVS (2016).

Public expenditure on health: domestic general government health expenditure as percentage of GDP. World Bank (2015).

Public expenditure on education: total government expenditure on education as percentage of GDP. World Bank (2018b).

Subsidies and other transfers: as percentage of total public expenditure. World Bank (2017g).

Total R&D expenditure: as percentage of GDP. World Bank (2016).

Growth rate of GDP per capita: annual percentage. World Bank (2017a).

International trade: the sum of exports and imports of goods and services as share of GDP. World Bank (2017h).

Credit provided by banks: the financial resources provided to the private sector by domestic money banks as a share of GDP. Domestic money banks comprise commercial banks and other financial institutions that accept transferable deposits, such as demand deposits. World Bank (2018a).

Stock market capitalisation: total value of all listed shares in a stock market as percentage of GDP. World Bank (2018a).

Liquid liabilities to GDP: liquid liabilities as percentage of GDP. Liquid liabilities are also known as broad money, or M3. They are the sum of currency and deposits in the central bank (M0), plus transferable deposits and electronic currency (M1), plus time and savings deposits, foreign currency transferable deposits, certificates of deposit, and securities repurchase agreements (M2), plus traveller's checks, foreign currency time deposits, commercial paper, and shares of mutual funds or market funds held by residents. World Bank (2018a).

Income inequality: the GINI index measures the extent to which the distribution of income among individuals or households within an economy deviates from a perfectly equal distribution. An index of 0 represents perfect equality, while an index of 100 implies perfect inequality. World Bank (2017c).

Poverty*:* the at-risk-of-poverty rate is the share of people with an equivalised disposable income (after social transfer) below the at-risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income after social transfers. Eurostat (2019).

Unemployment: the share of the labour force that is without work but available for and seeking employment. World Bank (2017i).

Quality of governance: average of two indicators: (i) voice and accountability (captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as

well as freedom of expression, freedom of association, and a free media) and (ii) government effectiveness (perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies). Both indicators range between -2.5 and 2.5. World Bank (2018c).

Political stability: measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. The estimates range between -2.5 to 2.5. World Bank (2018c).

Corruption: captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. The estimates range between -2.5 to 2.5. World Bank (2018c).

Gross fixed capital formation: investments in physical capital which includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. World Bank (2017d).

Population growth: difference in the natural logarithm of the population in two consecutive years. Calculated by using the total population aged 15-64. World Bank (2017f).

Inflation: measured by the consumer price index which reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services. World Bank (2017e).

Inflation variability: the standard deviation of inflation estimated as a centered three-year moving-average. World Bank (2017e).

Government consumption expenditure: includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation. World Bank (2017b).

Fairness: average valuation of the respondents whether they think others would try to be fair as opposed to that they think others would try to take advantage of them. EVS (2016).

Confidence in justice system: average level of confidence in the justice system on a scale from 1 to 4. EVS (2016).

Leisure time for rest: average valuation of the importance of leisure time for rest on a scale from 1 to 4. EVS (2016).

Leisure time for learning: average valuation of the importance of leisure time for learning on a scale from 1 to 4. EVS (2016).

Appendix B: Correlations

Table 5: Correlation Matrix

	Gene-rosity	HDI	Gene-rosity Lag 1	Donating	Volun-teering	Helping	GNI per capita	Life expectancy
Generosity	1.00							
HDI	0.72	1.00						
Generosity lag 1	0.93	0.72	1.00					
Donating	0.96	0.64	0.91	1.00				
Volunteering	0.87	0.74	0.82	0.76	1.00			
Helping stranger	0.86	0.60	0.77	0.75	0.68	1.00		
GNI per capita	0.69	0.79	0.70	0.66	0.69	0.51	1.00	
Life expectancy	0.62	0.78	0.61	0.56	0.62	0.54	0.72	1.00

Correlations between the main explanatory and dependent variables for all countries and all years.

Appendix C: Scatterplots of generosity and HDI

Figure 1: Scatterplot of generosity and the HDI for 2010

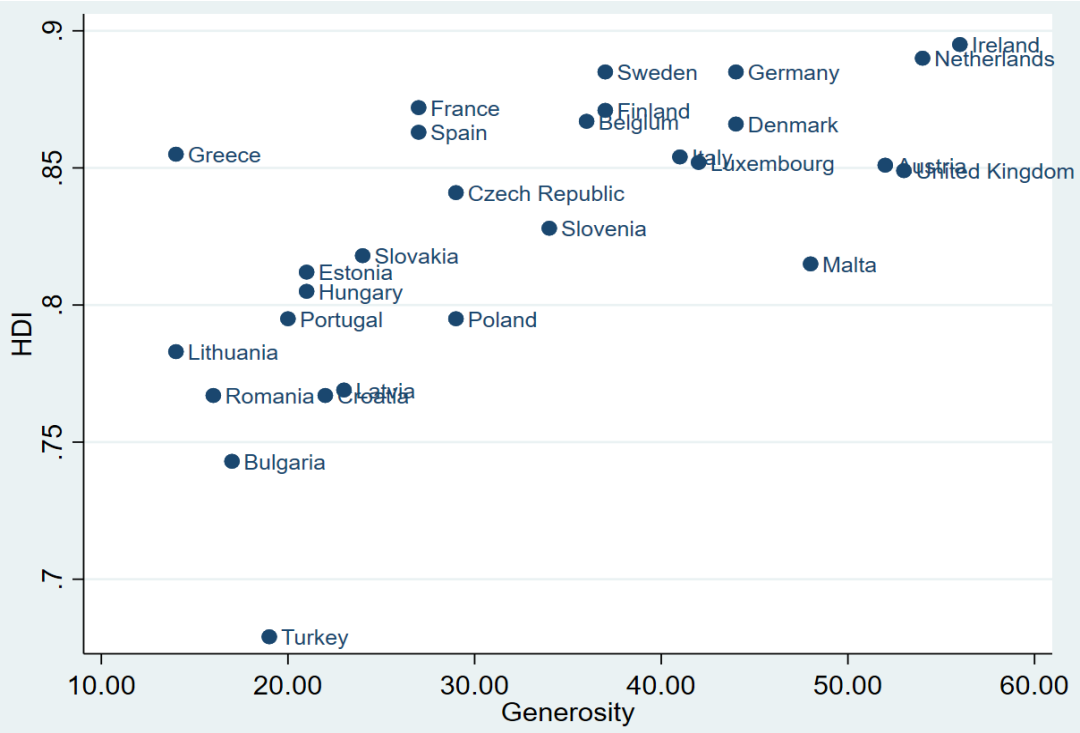


Figure 2: Scatterplot of generosity and the HDI for 2011.

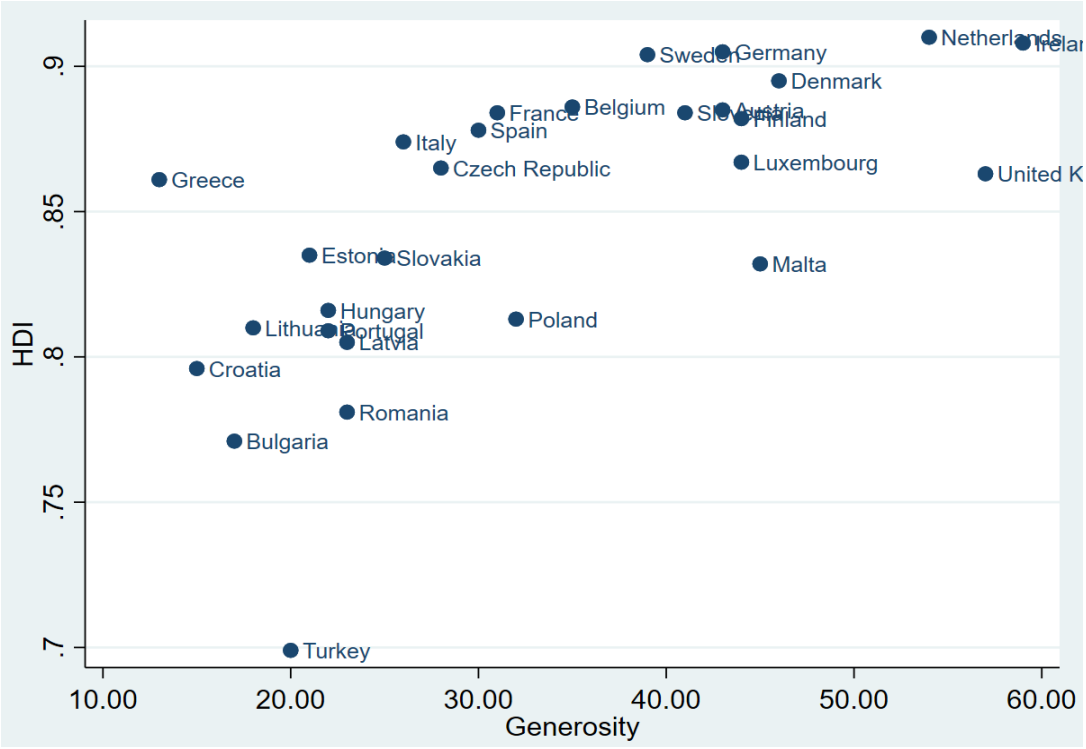


Figure 3: Scatterplot of generosity and the HDI for 2012.

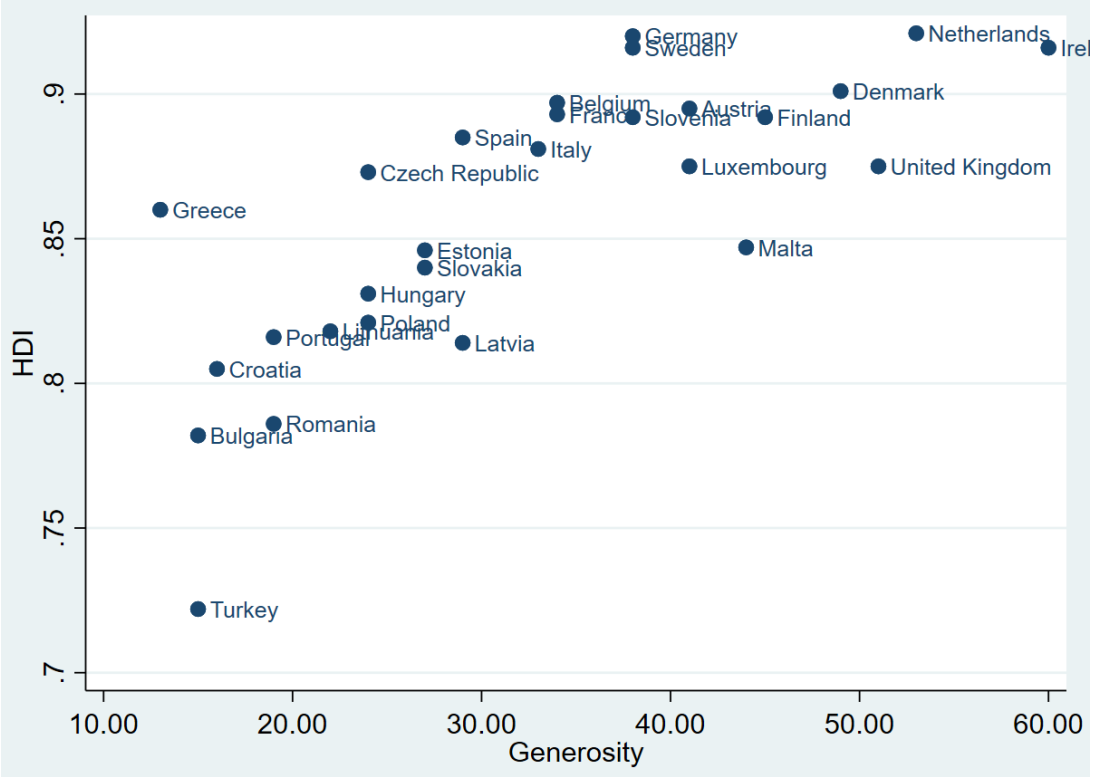


Figure 4: Scatterplot of generosity and the HDI for 2013.

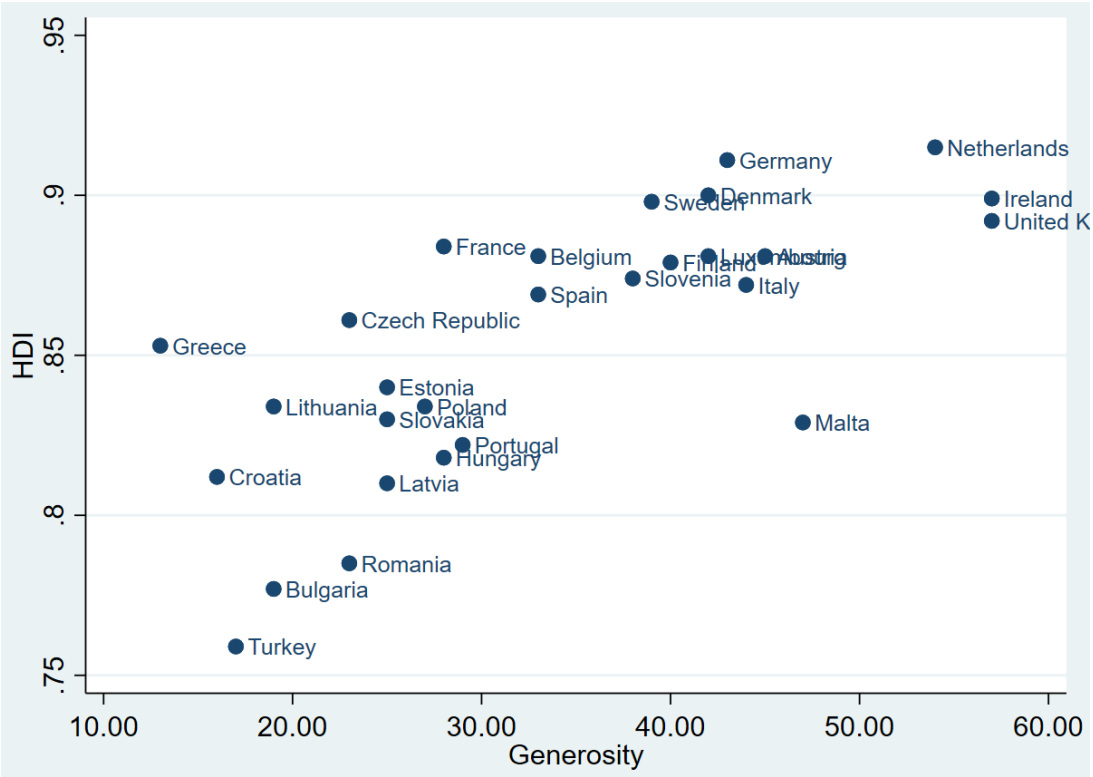


Figure 5: Scatterplot of generosity and the HDI for 2014.

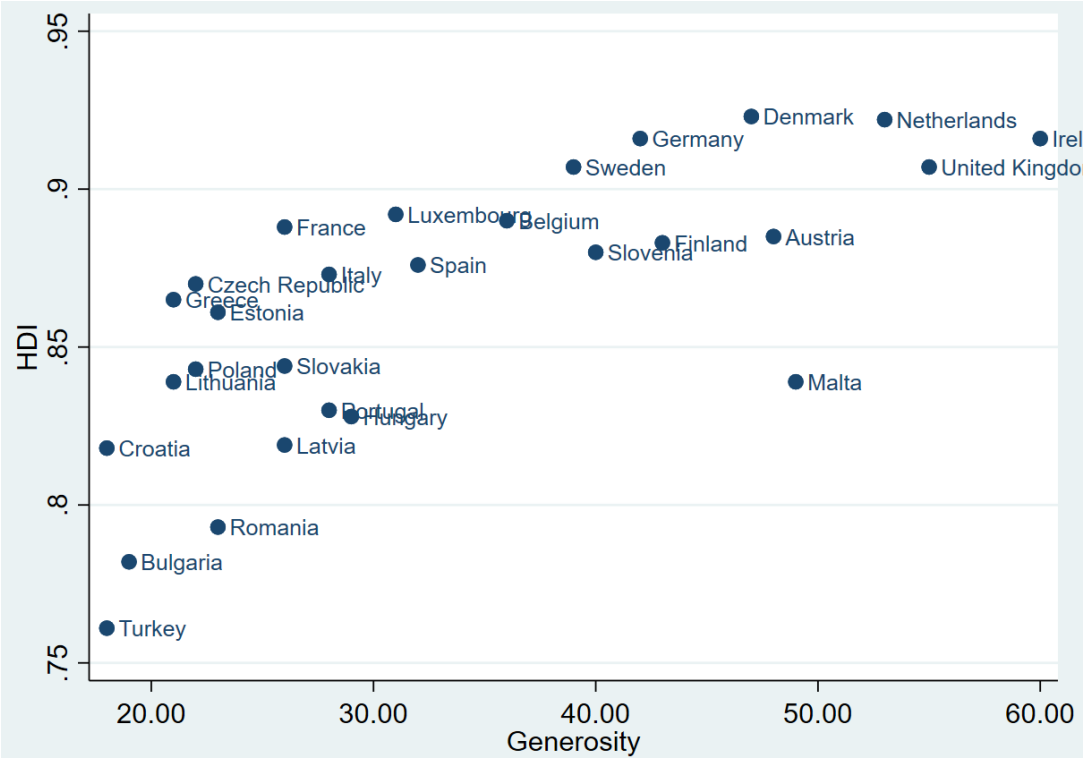
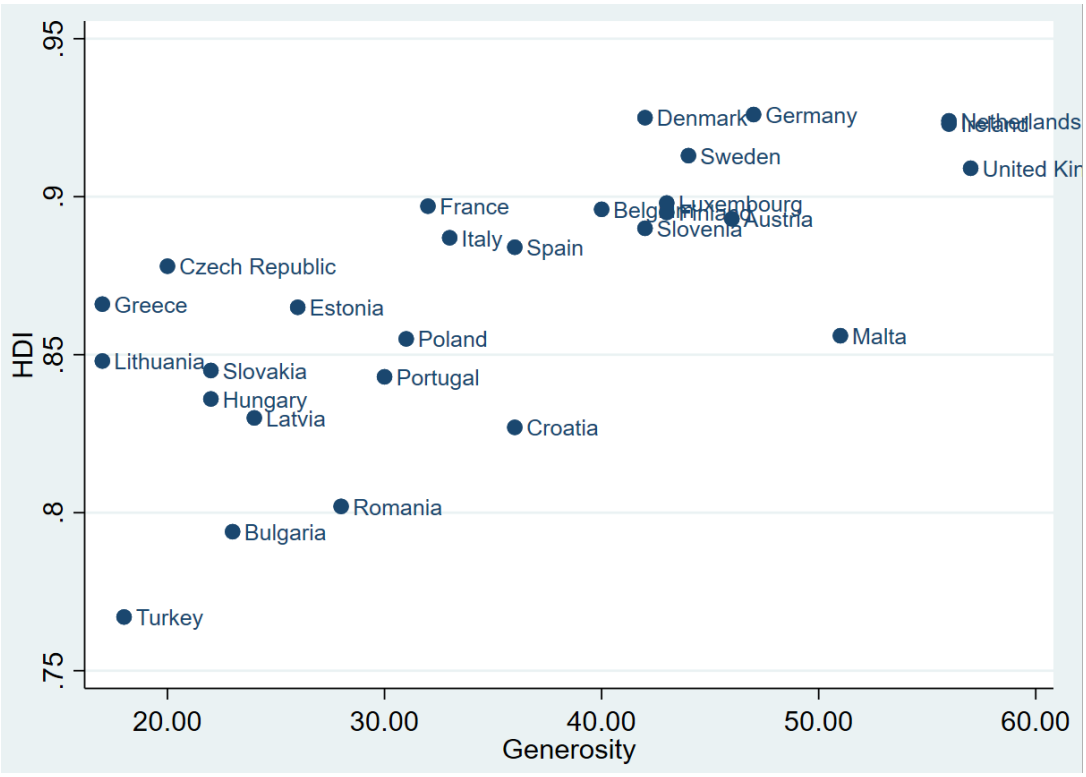


Figure 6: Scatterplot of generosity and the HDI for 2015.



Appendix D: Data overview per country

Table 6: Important variables per country

Country	Generosity	HDI	Donating	Volunteering	Helping stranger	GNI per capita	Life expectancy
Austria	45.83	0.88	55.50	28.33	54.00	43927	81.07
Belgium	35.67	0.89	39.33	25.17	42.83	41353	80.43
Bulgaria	18.33	0.77	16.17	5.00	34.00	15481	73.78
Croatia	20.50	0.80	20.50	8.17	32.33	29038	76.98
Czech Republic	24.33	0.86	25.00	15.17	32.50	26733	77.92
Denmark	45.00	0.90	61.50	21.83	51.50	44222	79.42
Estonia	23.83	0.84	16.17	17.67	38.33	24275	75.28
Finland	42.00	0.88	43.67	29.00	53.33	39489	80.42
France	29.67	0.89	27.50	25.83	35.67	37863	81.87
Germany	42.83	0.91	46.50	26.67	56.00	43569	80.65
Greece	15.17	0.86	7.00	5.33	32.83	25598	80.40
Hungary	24.33	0.82	2.17	9.67	40.83	22039	74.67
Ireland	58.00	0.91	72.83	37.67	63.00	39744	80.72
Italy	34.17	0.87	40.33	16.50	45.83	34463	82.35
Latvia	25.00	0.81	26.00	13.17	35.67	20639	73.43
Lithuania	18.50	0.82	10.17	8.83	35.83	23412	72.62
Luxembourg	40.50	0.88	52.67	28.33	40.33	62468	80.68
Malta	47.33	0.84	73.67	23.83	44.33	27503	80.08
Netherlands	54.00	0.91	72.83	36.17	53.00	46403	81.02
Poland	27.50	0.83	31.83	10.67	39.83	22412	76.63
Portugal	24.67	0.82	21.67	12.83	39.67	25915	80.05
Romania	22.00	0.79	21.17	6.17	38.67	18062	74.12
Slovakia	24.83	0.84	29.50	13.17	31.50	25358	75.70
Slovenia	38.83	0.87	38.00	33.00	45.67	27973	79.70
Spain	31.17	0.88	28.17	16.00	49.83	31895	81.97
Sweden	39.33	0.90	55.00	12.67	50.50	44939	81.77
Turkey	17.83	0.73	12.50	5.50	36.00	17818	74.42
United Kingdom	55.00	0.88	74.83	28.83	61.00	37125	80.38

The average levels of the main explanatory variables and dependent variables for all countries for the years 2010-2015.

Appendix E: Regressions without control variables

Table 7: Estimates of the effect of generosity on the Human Development Index

Dependent variable: HDI	(I) FE	(II) RE	(III) FE	(IV) RE	(V) OLS
Constant	0.8285*** (0.0133)	0.8016*** (0.0121)	0.8418*** (0.0157)	0.8048*** (0.0129)	0.7577*** (0.0155)
Generosity	0.0008* (0.0004)	0.0016*** (0.0003)	0.0005 (0.0003)	0.0010*** (0.0003)	0.0018*** (0.0006)
Generosity lag 1			0.0000 (0.0003)	0.0006** (0.0003)	
General trust					0.0011** (0.0004)
Adjusted R^2					0.63
F statistic	3.50 [0.06]	24.26 [0.00]	1.23 [0.30]	11.56 [0.00]	23.58 [0.00]

Regressions with the HDI as dependent variable and generosity and lagged generosity as explanatory variables. Regression (V), which is the OLS regression, contains general trust as additional explanatory variable. Regressions (I) and (III) include country-specific fixed effects. All regressions are without control variables. Standard errors are in parentheses. Probabilities are in brackets.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

Table 8: Estimates of the effect of the generosity components on the Human Development Index

Dependent variable: HDI	(VI) FE	(VII) RE	(VIII) FE	(VIV) RE	(X) OLS
Constant	0.8192***	0.7923***	0.8390***	0.8013***	0.7657***
	(0.1312)	(0.0129)	(0.0155)	(0.0137)	(0.0297)
Donating	-0.0005**	-0.0002	0.0000	0.0002	-0.0003
	(0.0003)	(0.0002)	(0.0002)	(0.0002)	(0.0005)
Donating lag 1			-0.0005**	-0.0002	
			(0.0002)	(0.0002)	
Volunteering	0.0006	0.0016***	0.0004	0.0011***	0.0029***
	(0.0006)	(0.0005)	(0.0005)	(0.0004)	(0.0008)
Volunteering lag 1			-0.0000	0.0006	
			(0.0005)	(0.0005)	
Helping a stranger	0.0010***	0.0008***	0.0001	-0.0000	0.0001
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0010)
Helping a stranger lag 1			0.0006**	0.0006**	
			(0.0003)	(0.0003)	
General trust					0.0013***
					(0.0004)
Adjusted R^2					0.70
F statistic	5.78	12.44	2.13	5.57	16.55
	[0.00]	[0.00]	[0.06]	[0.00]	[0.00]

Regressions with the HDI as dependent variable and the components of generosity and their one-year lagged values as explanatory variables. Regression (V), which is the OLS regression, contains general trust as additional explanatory variable. Regressions (I) and (III) include country-specific fixed effects. All regressions are without control variables. Standard errors are in parentheses. Probabilities are in brackets.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

Table 9: Estimates of the effect of generosity on Gross National Income

Dependent variable: GNI	(XI) FE	(XII) RE	(XIII) FE	(XIV) RE	(XV) OLS
Constant	10.4901***	10.2655***	10.4879***	10.0800***	7.8496***
	(0.1190)	(0.1346)	(0.1684)	(0.1779)	(0.3540)
Generosity	-0.0498	0.0159	-0.1292***	-0.0681*	0.4557***
	(0.0347)	(0.0369)	(0.0333)	(0.0358)	(0.1401)
Generosity lag 1			0.0727*	0.1400***	
			(0.0370)	(0.0393)	
General trust					0.2696**
					(0.1102)
Adjusted R^2					0.65
F statistic	2.05	0.19	8.33	7.52	25.91
	[0.15]	[0.67]	[0.00]	[0.00]	[0.00]

Regressions with the GNI per capita as dependent variable and generosity and lagged generosity as explanatory variables. Regression (V), which is the OLS regression, contains general trust as additional explanatory variable. Regressions (I) and (III) include country-specific fixed effects. All regressions are without control variables. Standard errors are in parentheses. Probabilities are in brackets. Note: all variables have been logarithmically transformed.

* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

Table 10: Estimates of the effect of the generosity components on Gross National Income

Dependent variable: GNI	(XVI) FE	(XVII) RE	(XVIII) FE	(XIV) RE	(XX) OLS
Constant	10.3243***	10.2203***	10.2530***	10.0296***	9.0947***
	(0.1396)	(0.1603)	(0.1930)	(0.2184)	(0.3146)
Donating	0.0172	0.0416*	-0.0429*	-0.0216	0.0038
	(0.0221)	(0.0240)	(0.0240)	(0.0269)	(0.0036)
Donating lag 1			0.0525**	0.0862***	
			(0.0223)	(0.0246)	
Volunteering	-0.0687***	-0.0335	-0.0417*	-0.0063	0.0156**
	(0.0250)	(0.0270)	(0.0243)	(0.0271)	(0.0065)
Volunteering lag 1			-0.0328	-0.0104	
			(0.0249)	(0.0280)	
Helping a stranger	0.0333	0.0130	0.0152	-0.0154	-0.0081
	(0.0447)	(0.0492)	(0.0459)	(0.0520)	(0.0080)
Helping a stranger lag 1			0.0496	0.0475	
			(0.0469)	(0.0534)	
General trust					0.3396***
					(0.1097)
Adjusted R^2					0.67
F statistic	2.64	1.27	4.04	3.26	14.50
	[0.05]	[0.28]	[0.00]	[0.00]	[0.00]

Regressions with the GNI per capita as dependent variable and the components of generosity and their one-year lagged values as explanatory variables. Regression (V), which is the OLS regression, contains general trust as additional explanatory variable. Regressions (I) and (III) include country-specific fixed effects. All regressions are without control variables. Standard errors are in parentheses. Probabilities are in brackets. Note: all variables have been logarithmically transformed.

* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

Table 11: Estimates of the effect of generosity on general trust

Dependent variable: general trust	(XXI) OLS
Constant	4.1870
	(7.5957)
Generosity	0.8686***
	(0.2156)
Adjusted R^2	0.36
F statistic	16.23
	[0.00]

Cross-sectional OLS regression of general trust on generosity. The regression excludes any control variables. Standard errors are in parentheses. Probabilities are in brackets.

* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

Appendix F: Relative Impact of the HDI Dimensions

Table 12: Estimates of the effects of the dimensions of human development on the HDI

Dependent variable: HDI	(20) FE	(21) RE
Constant	-2.7210***	-2.3486***
	(0.4381)	(0.1228)
GNI	0.0392***	0.0443***
	(0.0129)	(0.0040)
Life expectancy	0.5743***	0.4615***
	(0.1148)	(0.0369)
Mean years of schooling	0.1362***	0.1331***
	(0.0132)	(0.0070)
Expected years of schooling	0.1234***	0.1501***
	(0.0273)	(0.0126)
Overall R^2	0.97	0.97
F statistic	129.14	
	[0.00]	
Wald Chi^2		3490.94
		[0.00]

Regressions with the HDI as dependent variable and its components as explanatory variables. Regression (20) includes country specific fixed effects. Both regressions are without control variables. Standard errors are in parentheses. Probabilities are in brackets. Note: all explanatory variables have been logarithmically transformed as to make the effects of the different dimensions comparable.

* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

Appendix G: Direction of the relationship

Table 13: Estimates of the effect of the lagged values of generosity on the Human Development Index, with Fixed Effects

Dependent variable: HDI	(22) FE	(23) FE	(24) FE	(25) FE	(26) FE
Constant	0.8285***	0.8418***	0.8265***	0.7687***	0.7406***
	(0.0133)	(0.0157)	(0.016)	(0.0351)	(0.0513)
Generosity	0.0008*	0.0005	0.0006**	0.0008**	0.0008**
	(0.0004)	(0.0003)	(0.0003)	(0.0003)	(0.0004)
Generosity lag 1		0.0000	-0.0000	0.0006	0.0005
		(0.0003)	(0.0004)	(0.0004)	(0.0004)
Generosity lag 2			0.0005	0.0008*	0.0012**
			(0.0004)	(0.0004)	(0.0005)
Generosity lag 3				0.0006	0.0008
				(0.0004)	(0.0006)
Generosity lag 4					0.0006
					(0.0004)
Overall R^2	0.48	0.52	0.56	0.58	0.60
F statistic	3.50	1.23	2.05	2.27	2.37
	[0.06]	[0.30]	[0.11]	[0.07]	[0.07]

Regressions with the HDI as dependent variable and generosity and its lagged values as explanatory variables. All regressions include country-specific fixed effects. All regressions are without control variables. Standard errors are in parentheses. Probabilities are in brackets.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

Table 14: Estimates of the effect of the lagged values of generosity on the Human Development Index, without Fixed Effects

Dependent variable: HDI	(27) RE	(28) RE	(29) RE	(30) RE	(31) RE
Constant	0.8016*** (0.0121)	0.8048*** (0.0129)	0.7896*** (0.0136)	0.7738*** (0.0140)	0.7754*** (0.0145)
Generosity	0.0016*** (0.0003)	0.0010*** (0.0003)	0.0009*** (0.0003)	0.0007*** (0.0003)	0.0006** (0.0003)
Generosity lag 1		0.0006** (0.0003)	0.0004 (0.0003)	0.0006** (0.0003)	0.0002 (0.0003)
Generosity lag 2			0.0009*** (0.0003)	0.0008** (0.0003)	0.0009*** (0.0003)
Generosity lag 3				0.0006** (0.0003)	0.0005* (0.0003)
Generosity lag 4					0.0005 (0.0003)
Overall R^2	0.48	0.53	0.57	0.58	0.60
F statistic	24.26 [0.00]	11.56 [0.00]	12.07 [0.00]	11.73 [0.00]	10.10 [0.00]

Regressions with the HDI as dependent variable and generosity and its lagged values as explanatory variables. All regressions are without control variables. Standard errors are in parentheses. Probabilities are in brackets.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

Table 15: Estimates of the effect of the lagged values of the Human Development Index on generosity, with Fixed Effects

Dependent variable: Generosity	(32) FE	(33) FE	(34) FE	(35) FE	(36) FE
Constant	5.1400	-6.2623	-49.427	-70.578	-277.85
	(14.926)	(25.051)	(39.209)	(77.789)	(194.80)
HDI	32.738*	36.506	66.422	122.27	378.61
	(17.487)	(39.508)	(46.510)	(107.71)	(260.81)
HDI lag 1		9.6213	-3.4166	1.8453	-83.045
		(27.959)	(50.875)	(57.511)	(168.66)
HDI lag 2			33.712	5.3230	86.512
			(29.897)	(59.802)	(86.746)
HDI lag 3				-8.5028	-42.520
				(60.872)	(235.87)
HDI lag 4					20.6996
					(100.5078)
Overall R^2	0.48	0.51	0.52	0.52	0.52
F statistic	3.50	1.29	1.93	1.03	1.40
	[0.06]	[0.28]	[0.13]	[0.40]	[0.26]

Regressions with generosity as dependent variable and the HDI and its lagged values as explanatory variables. All regressions include country-specific fixed effects. All regressions are without control variables. Standard errors are in parentheses. Probabilities are in brackets.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

Table 16: Estimates of the effect of the lagged values of the Human Development Index on generosity, without Fixed Effects

Dependent variable: Generosity	(37) RE	(38) RE	(39) RE	(40) RE	(41) RE
Constant	-23.044	-64.437***	-108.85***	-140.31***	-157.82***
	(14.148)	(19.985)	(23.959)	(31.575)	(34.752)
HDI	65.764***	102.03***	106.76**	198.28**	362.98**
	(16.4629)	(37.1225)	(43.730)	(83.434)	(156.51)
HDI lag 1		11.877	25.415	16.097	-121.81
		(29.2923)	(48.961)	(53.128)	(136.05)
HDI lag 2			33.746	31.465	43.029
			(30.321)	(50.703)	(70.952)
HDI lag 3				-44.412	-88.381
				(51.395)	(149.75)
HDI lag 4					24.406
					(83.229)
Overall R^2	0.48	0.51	0.53	0.53	0.53
F statistic	15.96	12.10	12.30	8.46	7.76
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]

Regressions with the HDI as dependent variable and generosity and its lagged values as explanatory variables. All regressions are without control variables. Standard errors are in parentheses. Probabilities are in brackets.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

Appendix H: Variation in generosity

Table 17: Variation in generosity

Country	Variation
Austria	3.53
Belgium	2.21
Bulgaria	2.49
Croatia	7.30
Czech Republic	3.20
Denmark	2.58
Estonia	2.34
Finland	2.71
France	2.87
Germany	2.67
Greece	2.97
Hungary	3.09
Ireland	1.73
Italy	6.47
Latvia	2.08
Lithuania	2.63
Luxembourg	4.35
Malta	2.36
Netherlands	1.00
Poland	3.59
Portugal	4.46
Romania	3.74
Slovakia	1.57
Slovenia	2.61
Spain	2.91
Sweden	2.21
Turkey	1.57
United Kingdom	2.31

Variation in generosity per country in the form of the standard deviation.

Appendix I: Robustness

Table 18: Estimates of the effect of generosity on the Human Development Index

Dependent variable: HDI	(42) FE	(43) RE	(44) FE	(45) RE
Constant	1.1416***	0.8534***	1.2018***	0.8718***
	(0.1312)	(0.0979)	(0.1730)	(0.1182)
Generosity	-0.0001	0.0008		
	(0.0004)	(0.0005)		
Generosity lag 1	-0.0007	0.0004		
	(0.0005)	(0.0005)		
Donating			0.0002	0.0000
			(0.0005)	(0.0007)
Donating lag 1			-0.0003	-0.0001
			(0.0003)	(0.0004)
Volunteering			-0.0009	0.0018
			(0.0010)	(0.0013)
Volunteering lag 1			-0.0002	0.0015
			(0.0012)	(0.0016)
Helping a stranger			0.0001	-0.0006
			(0.0004)	(0.0006)
Helping a stranger lag 1			-0.0004	-0.0004
			(0.0006)	(0.0007)
General trust				
Adjusted R^2				
F statistic	2.98	11.26	2.24	9.76
	[0.03]	[0.00]	[0.12]	[0.00]

Regressions with the HDI as dependent variable. The researched countries are Austria, Croatia, Czech Republic, Hungary, Italy, Luxembourg, Poland and Portugal. Regressions (42) and (43) include generosity and its one-year lagged value as explanatory variables while regressions (44) and (45) contain the components of generosity and their one-year lagged values as explanatory variables. Regressions (42) and (44) include country-specific fixed effects. All regressions include the following set of controls: public expenditure on health, public expenditure on education, subsidies and other transfers, total R&D expenditure, growth rate of GDP per capita, international trade, credit provided by banks, stock market capitalisation, liquid liabilities to GDP, income inequality, poverty, unemployment, quality of governance, political stability and corruption. Standard errors are in parentheses. Probabilities are in brackets.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

Table 19: Estimates of the effect of generosity on Gross National Income

Dependent variable: GNI	(46) FE	(47) RE	(48) FE	(49) RE
Constant	13.2146*** (3.8307)	11.329*** (1.778)	8.8612* (4.0619)	11.1852*** (2.0268)
Generosity	-0.2401*** (0.0515)	-0.1866*** (0.0517)		
Generosity lag 1	-0.1274 (0.0790)	0.0667 (0.0631)		
Donating			-0.1905** (0.0635)	-0.2255*** (0.0658)
Donating lag 1			-0.0891 (0.0683)	0.0911 (0.0555)
Volunteering			-0.0104 (0.0814)	0.1068 (0.0656)
Volunteering lag 1			-0.0474 (0.0780)	-0.0545 (0.0595)
Helping a stranger			0.0457 (0.0582)	-0.0182 (0.0711)
Helping a stranger lag 1			0.0633 (0.0903)	0.0328 (0.0788)
General trust				
Adjusted R^2				
F statistic	4.18 [0.00]	98.82 [0.00]	5.97 [0.00]	101.08 [0.00]

Regressions with GNI per capita as dependent variable. The researched countries are Austria, Croatia, Czech Republic, Hungary, Italy, Luxembourg, Poland and Portugal. Regressions (46) and (47) include generosity and its one-year lagged value as explanatory variables while regressions (48) and (49) contain the components of generosity and their one-year lagged values as explanatory variables. Regressions (46) and (48) include country-specific fixed effects. All regressions include the following set of controls: one-year lagged value of GNI, gross fixed capital formation, mean years of schooling, population growth, total R&D expenditure, inflation, inflation variability, government consumption expenditure, international trade, credit provided by banks, stock market capitalisation and liquid liabilities to GDP. Standard errors are in parentheses. Probabilities are in brackets. Note: all variables have been logarithmically transformed.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

Table 19: Estimates of the effect of generosity on life expectancy

Dependent variable: Life expectancy	(50) FE	(51) RE	(52) FE	(53) RE
Constant	62.5232*** (11.1766)	58.7956*** (12.0361)	59.1666*** (9.8274)	59.2750*** (11.6448)
Generosity	(0.0176 (0.0207)	0.0269 (0.0434)		
Generosity lag 1	(0.0278 (0.0227)	0.0421 (0.0441)		
Donating			-0.0152 (0.0237)	-0.0676 (0.0523)
Donating lag 1			-0.0297* (0.0139)	-0.0087 (0.0350)
Volunteering			0.0035 (0.0410)	0.0696 (0.1092)
Volunteering lag 1			0.0215 (0.0400)	0.1023 (0.1451)
Helping a stranger			0.0177 (0.0150)	0.0571 (0.0441)
Helping a stranger lag 1			0.0474** (0.0179)	0.0062 (0.0605)
Adjusted R^2				
F statistic	2.71 [0.03]	12.00 [0.00]	4.62 [0.00]	10.12 [0.00]

Regressions with life expectancy as dependent variable. The researched countries are Austria, Croatia, Czech Republic, Hungary, Italy, Luxembourg, Poland and Portugal. Regressions (50) and (51) include generosity and its one-year lagged value as explanatory variables while regressions (52) and (53) contain the components of generosity and their one-year lagged values as explanatory variables. Regressions (50) and (52) include country-specific fixed effects. All regressions include the following set of controls: public expenditure on health, public expenditure on education, mean years of schooling, subsidies and other transfers, GDP per capita, income inequality, poverty and unemployment. Standard errors are in parentheses. Probabilities are in brackets.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.