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THE FORGOTTEN TRANSFER

A Microeconomic Perspective on the Relevance of Educational Level for Selection of Transaction Channel for Domestic EU Remittances

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Abstract

Up until today, academic research in the area of domestic remittances has been overshadowed by research on the globally far more recognized concept of international remittances. The abundance of research has furthermore focused on elucidating potential net benefits and drawbacks' stemming from these financial flows, without much emphasis on selection of transaction channels. There are, however, several reasons as to why this area should not be neglected given its interconnectedness with harvesting benefits and the general governmental interest to promote the usage of formal channels which are more easily monitored and can be regulated to prevent remittances being used for illegal purposes. European research on remittances has furthermore often been linked to migration and outflows to developing countries and analysis on domestic transfers on individual level is scarce. This thesis therefore aims to give new insight, from a EU perspective, in the sector of domestic remittances and individual-level motivators behind preference of a certain method for the transaction. Given identified linkages between educational level and selection of channel in the few existing previous studies, the thesis examines if the identified correlation holds also for domestic remittances while controlling for other potentially influential variables. Based on the results from a multinomial logistic regression on aggregated micro level data from 11 EU member states, the approximated relationship where a higher level of education increases the likelihood of a remitter selecting a formal transaction channel over an informal holds up for domestic remittance flows. The results further approximate significant predictions for the transaction channel selection from other variables such as age of the remitter.

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Abbreviations

AML	Anti-Money Laundering
CFT	Combatting Financing of Terrorism
CI	Confidence Interval
ECA	Europe and Central Asia
EU	European Union
FDI	Foreign Direct Investment
Findex Database	World Bank Global Financial Inclusion Database
GDP	Gross Domestic Product
ICT	Information and Communications Technology
IIA	Independence of Irrelevant Alternatives- Assumption
MLR	Multinomial Logistic Regression
MMTO	Mobile Money Transfer Operator
MTO	Money Transfer Operator
MVT service	Money or Value Transfer service
OLS	Ordinary Least Squares
OTC	Over the Counter
TC	Transaction Channel

Introduction

The amount of remittances sent across borders globally has increased by around 289 per cent from 1995 to 2005, with a total of US $167 billion in 2005 constituting compensation of employees, worker's remittances and transfers from migrants (Niimi and Özden, 2006). In 2015, global remittance flows where estimated to have exceeded US $601 billion and with the exact number being thought to have been even higher given difficulties in estimating flows through informal channels (World Bank Group, 2016). This increased importance of the field given its magnitude and growth has rendered an upsurge in the amount of academic research and several studies have been conducted to evaluate the impact stemming from remittances on financial and economic development as well as on poverty reduction (Karafolas and Konteos, 2010:963). A large part of the focus has furthermore been on migration as related to remittance corridors and how to facilitate these financial flows in order to promote development. The UN Agenda 2030 even incorporates a specific target connected to remittances for goal number 10 (no. 10c), which states the aim to; *"by 2030, reduce to less than 3 per cent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 per cent"*(United Nations, 2017).

Empirical research has to a large extent focused on developing countries, mainly African and Asian nations, and there is thus a lack of contemporary development analysis connected to remittance flows within Europe. This fact is especially true for European countries as receiver of remittances since many of the recent reports from, for example, the World Bank have addressed the shock originating from the financial crisis and impact for the ECA (Europe and Central Asia) region is often assessed by effect on developing countries in this region. Aside from this focus, research that can be found on remittances in Europe are also linked to migration and new migratory flows in connection to increased globalisation, see for example Carling (2008) and Özden and Schiff (2005). An even more limited amount of research focuses on EU member states and the majority of the existing knowledge is associated with international outflows and, as for the ECA region, migration and so called brain drain[1]. This absence of EU remittance research could be explained by the focus on development and poverty reduction in connection to the fact that relative poverty levels in EU member states are comparably low and living standards high in comparison to developing countries in other

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[1] The concept of brain drain refers to emigration of highly educated citizens in search of jobs with higher salaries and/or better conditions and benefits.

parts of the world. There is nevertheless reason not to omit this region seeing as about one third of the remittances sent by migrants within Europe in 2014 where received by people in other European countries. Out of the total 19 countries that constituted receiving countries in the Working Paper by IFAD, 10 were EU member states[2] (IFAD, 2015:6,10).

In order to estimate the impact stemming from remittance flows, it is important to acknowledge and analyse not only international but also domestic remittances, especially since international transfers often are re-distributed within national communities (Brown, Carling, Fransen and Siegel, 2014:1254). Intra-national migration has globally exceeded the number for cross country migration[3] (Esipova, Pugliese and Ray, 2013:3) and a survey conducted by Gallup between 2009-2010 showed that residents, globally, are three times more likely to receive remittances in the form of national transfers rather than international (Esipova et. al., 2013:3-5). Traditionally, the term remittance has been conceptualized as funds that are transferred across borders (Rahman, Bari and Sayeda, 2015:45), normally from developed countries to developing countries[4], but given the aforementioned redistribution and high volume of remittance flows within countries, research covering domestic remittances is essential.

Even though both forms essentially are homogenous in the sense that characteristics for domestic transfers often follow the main characteristics for international, described as a private, individual and nonmarket income transfers by Chami, Fullenkamp and Jahjah (2005:2-3) transferred between friends or family members, there are several distinct aspects which only applies to one or the other and that has to be taken into consideration when analysing the different flows. The most notable differences comprise macroeconomic factors and macroeconomic policy implications stemming from international transactions such as effects on currency value. If seen from a micro-economic, individual-level perspective, there are also differences in cost related to the selection of transaction channel (TC) given that cross-border transactions generally are more costly. Furthermore, geographical distance plays

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[2] Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovak Republic.
[3] According to a GALLUP survey from 2013 on 139 countries, around eight per cent of the worlds adult population had migrated within the recent five years, within the country. However, it needs to be taken into consideration that the recent refugee crisis has spurred international migratory movements and there is likely an increased amount of unregistered movement (for both international and intra-national migration).
[4] It should be noted that remittances include not only monetary transactions but can also be transfers in kind (transfers of goods). Given that the micro level data used for this study is delimited to represent monetary transfers, the main focus of the thesis will be on this category.

a larger part in international transfers than for domestic and there is thus a different amount of available transfer mechanisms at disposal depending on type of transfer.

For governments that wish to revise policies to facilitate these transfers, to in turn affect potential welfare gains, it is important to identify the underlying motivation for the remitters' selection of TC for the transfer. There is a broad spectrum of channels available, from informal cash transfers to highly regulated formal transfers through financial institutions, although accessibility for the individual may be limited due to for example account ownership and financial means. Identifying determinants for the selection of TC can serve as a foundation to governments in their pursuit of increasing citizen's incentive to choose formal TC's rather than informal to better capture the aforementioned gains. The promotion of formal channels over informal is, however, not only connected to potential gains but also to crime-control objectives and consumer protection. According to Passas (2005:11) several different policy priorities are presented such as preventing financing for terrorism, ensuring a level playing field for different money or value transfer services (MVT) and achieving increased transparency through identifying operators and clients. Although his research relates to the usage of the informal TC Hawala[5] for international transfers, these provisions are highly relevant for domestic transfers.

Up until today, analysis conducted on determinants for selection of TC connected to domestic remittances is lacking[6] but a few can be found on international remittances. When results from these previous studies are considered, a common denominator for many is the inclusion of educational level of the individual as an independent variable (or included as a variable in an index for socioeconomic status or personal characteristics). Research by Kosse and Vermeulen (2014:20) approximates that an individual's level of education has a significant effect on the selection of channel, higher educated individuals were more prone to select formal transfer channels. Alternative studies have shown correlation between these factors but only for certain levels of education, for example Siegel and Lücke (2013:136), whilst others such as Amjad, Irfan and Arif (2013:28,45) captures that the level of education does not have a considerable effect on channel selection. It is worth noting that this limited amount of

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[5] A more detailed explanation of the Hawala system is provided on page 15.
[6] Based on research and exploration by the author up until May 2017.

previous research within the field has been conducted on a wide variety of countries[7], which at least initially suggests that there may be regional or country variations as to the importance of educational level for the individual's decision. Given the fact that the research was made on country level, the analysis on EU countries will give new insight to this potential correlation on a more aggregated level. This will furthermore constitute a relevant contribution, not only to the field of remittance research but also to the field of European studies.

The above mentioned comparative lack of research connected to remittances in Europe combined with the oversight of domestic remittances and the diverging views on the role of educational level as a determinant for selection of TC constitutes a substantial gap in the existing research base. This analysis, which incorporates all these elements, makes up a relevant contribution to the field of domestic remittance research and the fairly unknown territory of educational level as a motivator for TC selection. By providing insight to the remitter's decision to select a formal or mixed transfer over an informal, the knowledge base is expanded and the focus on EU member states provides an even more succinct contribution to the field. The relevance of the study is furthermore connected to the creation of a substructure for governments when adapting provisions and directives for furthering usage of formal TC's over informal.

Objectives and Outline

As stated in the introduction, research on domestic remittances and the role of education for selection of TC within Europe, and especially within the EU, remains comparably unexplored. The fundamental aim of this thesis is therefore to give a holistic overview of what characterises the flow of domestic remittance transfers in EU member states with an emphasis on the effect stemming from an individual's educational level on selection of transfer channel in the EU. Based on this aim, the following research questions are identified:

1. *What effect does educational level of the remitter have on selection of transaction channel for domestic EU remittances?*

2. *What policy implications can be derived from the aforementioned relationship?*

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[7] The previously mentioned authors have for example conducted research on data from The Netherlands (Kosse and Vermeulen, 2014), Moldova (Siegel and Lücke, 2013) and Pakistan (Amjad et al., 2013).

The outline of this thesis will be as follows, after this presentation of the research questions derived from the previously identified research gap, previous research within the field of remittances and theories connected to TC's and remittances will be presented and the reader will receive an overview of the previous academic research on the relationship between educational level and selection of channel for transferring remittances. Before the applied statistical method is introduced, the sections including theory connected to remittances, methodical framework including for example selection of data and the analytical model are presented. Following the previously mentioned description of approach to analyse the research question will be the analysis and results of the conducted multinomial logistic regressions. The last section of the thesis contains final conclusions and suggestions for further research. In the appendix, which can be found after the reference list, the reader will find specific data material referred to in the text and a more extensive presentation of the output from conducted regressions.

Previous Research

The development during the 21st century has shown an increased flow of international remittances to the ECA region, from 2010 until 2016, the average yearly growth rate approximated 10.5 per cent (Ratha, Eigen-Zucchi, Plaza, Wyss and Yi, 2013:3). Data on development of domestic transfers is lacking but given the common practice of re-distributing international funds nationally, as mentioned by Brown et al. (2014:1254), it is plausible to assume an increase in these transactions as well. As stated in the introduction, the emphasis in remittance research for international transfers has traditionally been on macroeconomic effects, especially connected to labour movement and the creation of real net social benefits. Conclusions based on the results from this previous research differ to a large extent in many aspects. Several academic studies confirm the positive impact on economic growth for countries receiving a high amount of remittances, one example of this is the research by Adams Jr and Page (2005:1660) where the authors conclude that *"remittances have a strong, statistically significant impact on reducing poverty in the developing world"*. Aggarwal, Demirgüç-Kunt and Martinez Peria (2006) captures that remittance flows stimulate economic development in the receiving country (in their case, with a positive effect on level of bank deposits and credit to GDP-ratio). In contrast to these findings, Chami, Fullenkamp and Jahjah (2003:22) find that the impact from remittance transfers tends to be negatively

correlated with economic growth (growth in GDP) and they highlight the problem of moral hazard which is just one of the different problems arguably related to this type of transfer. Another example of a negative aspect connected to international remittance transfers is the Dutch disease-effect, which relates to the increased value of a country's currency and in turn, increased unemployment and decreased foreign direct investment (FDI) to the affected country. Many of these effects are however unique for international flows and not applicable to domestic remittances, for example specific currency-related problems. Moreover, research has focused on the interplay between migration and remittances as well as brain drain and education as a factor for emigrating and sending money home (Özden and Schiff, 2005).

As can be seen from the above mentioned, the majority of previous academic research have addressed the question of benefits or drawbacks stemming from remittance transfers but fewer have analysed the selection of channels utilised for the transfer and which factors that are at play in the remitter's selection of method for the transaction. Previous shallow attempts at analysing TC's have mainly taken the form of sub-questions in larger studies connected to general importance of remittances for development and they have to a large extent focused on developing nations in Africa and Asia. Despite this common focus on remittance as an international transfer with the potential to promote economic growth, the discourse has now started to change slightly to include also a microeconomic perspective incorporating for example the recipient's usage of the received funds (Puri and Ritzema, 1999:10,15).

4.1 Determinants for Selection of Transaction Channel

A rare contemporary attempt at elucidating specifically the area of TC's was made by Kosse and Vermeulen (2014), who explicitly investigated the role of general payment habits for the selection of channel for international remittances. The result of their research on micro level data for more than 1600 migrant respondents in the Netherlands suggested that there was an effect on migrants' choice of remittance channel emanating from general payment habits but that this effect was small and that other factors, such as remittance amount and personal characteristics would be more important for the decision (Kosse and Vermeulen, 2014:23). Another recent study on Indian migrant workers indicated that main aspects when selecting method of transfer were security and speed of delivery whilst cost were of less importance given that the other requirements were met. With this being said, the study also identified a

trade-off between the preference of channel and cost of remitting and that slight decreases in cost could render substantial effects on the choice between a formal and informal method of transaction (Gopinath, Oliver, Tannirkulam, Bhattacharya and Kulkarni, 2010:8,20). In line with the study by Gopinath et al. (2010) were the findings by Karafolas and Konteos (2010:969) who found that speed of transfer was more important than cost when selecting method of transfer for Albanian immigrants residing in Greece.

There are furthermore identified linkages between the age of an individual and technology adoption, younger people are on average more prone to adopt new technology as for example mobile banking services (Koenig-Lewis, Palmer and Moll, 2010:424-425). In addition to this, statistical research on European countries has shown that younger generations generally have higher information and communications technology (ICT) skills than the rest of the population (Eurostat, 2015:199). Intuitively, it would therefore be more likely for younger individuals to select channels involving the usage of technology, ceteris paribus. Nonetheless, the above-mentioned research by Kosse and Vermeulen (2014:20) for international transfers did not capture any significant effect connected to age when analysing influential factors for the probability of selecting a specific channel.

The remitter's selection between informal and formal channels is likely affected by policy measures, according to Puri and Ritzema (1999:19), mainly directed at promoting usage of formal channels for harvesting net social benefits from the transferred funds. However, the distinction between informal and formal channels is difficult to make since the division can vary depending on for example institutional structure and regulatory regime of the country (ibid, 2009:6) and there are currently differing prevalent definitions. Examples of reforms and policies directed at furthering usage of formal channels are; development of attractive financial instruments, ensuring a fair market for providers of remittance services, macroeconomic reforms and legislation connected to curb illegal activities such as money laundering (Amjad et al., 2013:30-31).

Taking the above mentioned into account, it is important to consider that certain factors such as cost are different between domestic and international transfers based on the relative importance of the factor at hand, it is for example generally more expensive to send cross border transfers than transfers within a country. It should also be noted that the

aforementioned importance of delivery speed is likely less applicable for domestic remittances. For the EU, there are specific directives stating that it should not take more than one day for transactions in EUR or any other member state currency to be executed (European Parliament and Council Directive 2007/64/EC, 2007:§43).

4.1.1 The Role of Educational Level

In the limited amount of previous research on TC selection for remittances, two general orientations can be identified; either the main focus is on the role of external factors such as cost, delivery speed and security issues or the focal point is on personal characteristics of the remitter such as gender, age, socioeconomic status or educational level. The preponderance is related to external factors but a growing attention is given to characteristics of the remitter and educational level stands out as one of the more frequently mentioned. Siegel and Lücke (2013:121,136) conducted an analysis based on a household survey in Moldova and found that level of education only had an effect on selecting a formal channel over an informal for educational levels up to secondary education. Migrants who had not completed secondary education were less likely to select a formal TC relative to those with a higher level of education and those with completed secondary education or higher were less likely to select an informal. They could, however, not identify any significantly predicted effect between higher education levels such as completed tertiary relative to completed secondary.

The research by Amjad et al. (2013:18,22,45-46), presented the hypothesis that migrants with a higher level of education would be more prone to use a bank channel for remittances, which was analysed by constructing a logistic regression to investigate the preference for official over unofficial channels. Their results approximated a correlation between migrants with middle or matriculate level of education and the likelihood of selecting a bank channel relative to those with lower education. However, on an aggregated level, they could not capture any great difference based on educational level for the selection of an official or unofficial channel, a fact that they partly attributed to the fact that this was a small household survey. The aforementioned research by Kosse and Vermeulen on the other hand captured a statistically significant effect between educational level of the remitter and the likelihood of selecting an informal channel, the higher the level of education the less likely the remitter were to use informal channels rather than formal (2014:2,33-34).

It should be noted that data on remittance flows including specification of selected channel for the transaction is scarce. A majority of the existing material is made up by macro-level data that would be suitable for analysing state or country level effects such as economic growth or poverty reduction but is less appropriate for examining individual based decisions such as the approach to how the amount is sent to the recipient. The following analysis is therefore based on the aforementioned early indications of the correlation between the variables, namely that there is a connection between higher education and a preference of formal channels. Even though this connection is somewhat inconclusive, it is of interest to analyse if this correlation is present also for domestic EU remittances. Educational level as the main indicator is moreover selected given the suggested lower importance of external factors such as cost and transfer speed for domestic transfers. Since there are diverging views on the relevance of this relationship depending on exact level of education, hypotheses are deliberately formed as not stating exact levels but in terms of the more general " a higher level". Bearing in mind the aim of the study and the previous research, the following hypotheses are derived:

H_1: A higher level of education of the remitter increases the preference for selecting a formal transaction channel, constituting financial institution, MTO or mobile phone, over an informal channel for domestic remittance transfers.

H_2: A higher level of education of the remitter increases the preference for selecting a mix of informal and formal channels for domestic remittance transfers over only informal, constituting cash transfer, channels.

Theory in the Field of Remittances

In order to analyse the underlying determinants for the selection of remittance channel, it is of relevance to firstly recognize the remitter's immanent reasoning behind remitting. During recent years, there has been a rapid development of research in this area and there are divergent theoretical "camps". According to Cox, Eser and Jimenez (1997), there is evidence that transfers are exchange motivated rather than based solely on altruism. They support this theory with their findings that the remittance amount seems to increase with the income of the recipient even when taking into account the effect from utility interdependence (Cox, Eser and Jimenez, 1997:75,77-78). Most of the traditional economic schools of thought such as

Monetarism, the New Keynesian school and the Neoclassical theory presuppose rational expectations from the individual, which would in turn indicate that the remitter acts rationally in his or her decisions connected to the transfer.

Contrary to these theories, the theory of Behavioural Economics aims to analyse why these postulations may not be accurate given the occasional irrational behaviour by individuals. In this theory, changes in the preference of an individual, such as preference for a certain TC, could depend on for example temporary short-term fluctuations, long-term systematic changes or adaptation to changes. Individuals could additionally be subject to projection bias, an own underestimation of the change in preference by projecting current preferences onto future (Loewenstein, O'Donoghue and Rabin, 2003:1210,1212-1213,1226). Based on this, any results derived from a statistical analysis for predicting an outcome based on a certain factor, such as educational level, should be interpreted carefully as there may be inconsistencies over time for a respondent prone to over- or undervalue the utility derived from a certain selection. In order to identify projection bias, it would be optimal with multiple observations to examine whether there are any dynamic inconsistencies over time (Loewenstein et al., 2003:1238). Even though the usage of a specific TC is not to be considered as equivalent to obtaining a "durable good", it is important to note that alternative and more complex explanations can be attributed to this selection such as short-term changes due to psychological factors. Taking this into account, the analysis of the topic at hand still provides a relevant contribution seeing as further analysis incorporating behavioural or psychological elements can be extended to a more fundamental exploration.

Complicating the selection phase further, there are several reasons for a government to influence its citizens to select formal transaction channels for their financial transfers, including domestic remittances. Firstly, the informal market is less regulated and consumers are thus more vulnerable to market misbehaviour and there is a risk of individuals being lured or attracted to partake in illegal schemes. It is furthermore difficult to measure and analyse the informal market seeing as it is not governed in the same way as the formal, and there is thus a lack of statistical material available for evident reasons that could potentially have been used for future adaptations of regulation and policy development. The patrons of "remittances as a source for growth and economic development" would additionally point to the fact that a higher usage of formal channels support banks and financial institutions so they are able to

(1.) offer previously unbanked individuals access to a range of financial services and products (2.) increase their base for lending to other customers as their deposits increase (Aggarwal et al., 2006) (3.) find new incentives to promote financial inclusion and the industry's own interests to increase capacity and financial infrastructure.

5.1 European and EU Remittances

The outflow of remittances from Europe to other parts of the world was, for 2014, estimated to be around US $109.4 billion and the main sending countries were France, Germany, Italy, Spain, the United Kingdom and the Russian Federation. In the EU alone, an approximation of 10 million households are reliant on receiving remittances sent from family and friends from different parts of Europe (IFAD, 2015:10). From 2013 to 2015, the average growth rate of remittances sent within the EU was approximately 1.9 per cent and for remittances sent to countries outside the EU around 4.7 per cent (Eurostat, 2016a). Even though the amount of sent remittances has increased substantially over the last years, it would be precipitately to assume that this is connected to more remitters using formal channels rather than informal given the simultaneous development of measures for data collection (Freund and Spatafora, 2005:13). Research on international remittances have shown that flows on certain routes are more prone to being conducted through informal flows such as the route to Eastern Europe, Sub Saharan Africa and Central Asia. For international European remittance corridors, studies which have mapped out the prevalent transaction channels indicate that the most frequently used method is cash-to-cash transfer. Table 1 provides a summary of the amount of remittances sent between 2013 and 2015:

Table 1. Personal remittances, total outflow from the EU member states

EU 28	2013	2014	2015	Total average yearly growth rate
Intra-EU	55 769	56 721	59 023	1.9 %
Extra-EU	37 994	39 328	43 617	4.7 %
Total	93 773	96 058	102 644	3.1 %

Data: Eurostat 2016, Personal remittances, total outflow from the EU 28

Even though the prevailing understanding of the concept remittance is that of an international transfer, a broader scope that incorporates also domestic transfers is presented in the 2007 Payment Service Directive adopted by the European Parliament and the Council of the EU (European Parliament and Council Directive 2007/64/EC, 2007). In this directive, money remittances are defined as:

"...a payment service where funds are received from a payer, without any payment accounts being created in the name of the payer or the payee, for the sole purpose of transferring a corresponding amount to a payee or to another payment service provider acting on behalf of the payee, and/or where such funds are received on behalf of and made available to the payee." (European Parliament and Council Directive 2007/64/EC, 2007, Art 14§13)

As can be seen from this wording, there is no direct attribution to international transfers. The directive is furthermore stating that payment service providers, such as for remittances, could be treated as regular payment institutions given that they should be encompassed by applicable regulations in order to prevent black economy growth (European Parliament and Council Directive 2007/64/EC, 2007, §15). Furthermore, the fourth Anti-Money Laundering (AML) Directive refers back to the payment services directive and states that the activity of providing remittances service shall not be exempt from the scope of the AML directive (European Parliament and Council Directive 2015/849, 2015:Art.2§3). In this directive, sections connected to for example customer due diligence, obligations linked to reporting, supervision and national cooperation are included. The specific referral to remittances in said directive further indicates a formal EU stance on promoting registration of remittance service providers and formalization of processes and that this activity should be included when developing measures connected to AML and combatting financing of terrorism (CFT). The recommendations presented in 2012 by the Financial Action Task Force (FATF), an intergovernmental body created in 1989 for combatting ML/FT, refers back to their previously published guidance document on "Combating the Abuse of Alternative Remittance Systems" (FATF, 2012). This document contains focus areas of high importance in the work connected to AML/CFT such as (1.) the importance of licensing or registering persons or legal entities providing remittance services, (2.) ensuring that these providers are subject to certain provisions in the aforementioned recommendations from 2012 (specifically connected to AML) and (3.) monitor compliance to the aforementioned recommendations to identify

potential illegal activity (FATF, 2003:3-9). These main areas are, amongst others, incorporated in different forms in the fourth AML directive given that the EU Commission is one of the FATF-members and any increased focus on remittances related to AML/CFT for one is thus reflecting onto the other.

Even though concerns have been raised for the high volume of cash transfers and this channel's potential connection to illegal activities, other voices are putting forward the idea that the formalization of remittance transfers may not only be a benign phenomenon. In the recent publication by Passas (2016:74,78-79), the idea that restrictions to the usage of cash transfers will ultimately serve as risk-reducing is countered with suggested negative externalities which may occur due to these restrictions and formalizations such as financial exclusion, constrained growth and human rights violations. Seeing as informal transfers may still be the only option for some individuals in more remote or rural locations, these should arguably be seen as an opportunity for authorities and financial institutions to further development and humanitarian assistance.

5.1.1 Transfer Channels for Remittances

Access to various instruments for transferring funds is expanding and the area of financial services accessible to the general public is transforming, nowadays a substantial increase in mobile banking can be seen and the usage of various applications in connection to banking services. This development is not only reserved for high-income countries but has also been apparent, and in some sense predominant, in developing economies with a substantial increase in mobile banking services in both African countries and in India (Govindarajan, 2012). According to the publication by the International Fund for Agricultural Development (IFAD, 2015:7), mobile transfer services are becoming more and more common but remain costly for the remitter in comparison to other informal methods. Sending remittances through a mobile has however gained traction given its speed of transfer and relatively lower cost than those applicable for traditional (formal) TC's (International Monetary Fund, 2009:11).

Accessibility is normally connected to the possibility of utilising formal channels but regional and cultural disparities could affect the individual's derived utility from using one or the other (Hernández-Coss, 2005:9,15,27). An important distinction to make is that certain suggested determinants mentioned in connection to international transfers are not applicable for

domestic transfers such as price differences between countries, as mentioned by Puri and Ritzema (1999:9) as well as specific taxation and currency-related costs.

The great variety of channels available for remittance transfers range from fully informal to highly regulated formal channels and some of the more frequently mentioned are: cash transfers, money transfer organisations (MTO), commercial banks or financial institutions, mobile phone transfer, through a Hawala or Hundi agent and via postal network (International Monetary Fund, 2009:6-16). The most simplistic type of transfer in the sense of transfer interface and used networks is a "cash transfer" where the remitter physically brings cash to the recipient, either by own means or through a friend or family member. This method is associated with low cost but may also be inconvenient, especially for regular transfers due to for example geographical restrictions and inefficiency. Other relatively unregulated methods are the Hawala and Hundi systems, both of them characterised by a system based on trust where a broker specialised in these types of transfers assists the transfer process (the main difference being that Hundi could be seen as a financial instrument as it is a signed order of the transfer). Advanced forms of Hawala or Hundi arrangements can allow for quicker transfers via networks of agents. Event though these systems are often considered to be riskier and more unreliable due to their opaqueness, some researchers such as Passas (2016:79-80) argue that they serve an important purpose in providing cheap and efficient transfers in remote locations.

On the other side of the scale are the more regulated and controlled channels such as transfers via banks or other financial institutions and transfers via MTO's. Formal channels are generally speaking more costly for the remitter than informal ones and demand a higher degree of understanding of financial concepts (Freund and Spatafora, 2005:4-5). Even though the division of channels into formal and informal is frequently applied in remittance research, the demarcation is far from straightforward. Certain mobile phone transfers are made via telecommunications companies offering the service of sending money through for example text messages, such as "M-PESA" in certain African countries and "SMART Communications and Globe Telecom" in the Philippines. There are also more formal, in the sense of more regulated, institutions such as banks and MTO's, which are tapping into the market of mobile transfers such as "Swish" in Sweden, created through a joint cooperation between banks. Transfers through MTO's are furthermore often titled to be *over the counter*

(OTC) transactions since they do not require that the remitter hold a private account at the company providing the service. There are, however, also financial institutions and mobile money transfer operators (MMTO) that offer OTC transactions to their customers (Demirgüc-Kunt et al., 2015:36). Another factor complicating this separation into categories is the rapid development of new technology and channels for transferring remittances (International Monetary Fund, 2009:6). The fact that this division is still commonplace despite the complex relationship is likely due to feasibility of conducting analysis within the field and, more specifically, on developing policies and regulations covering remittance service providers.

Figure 1. Illustration of the Selection Process
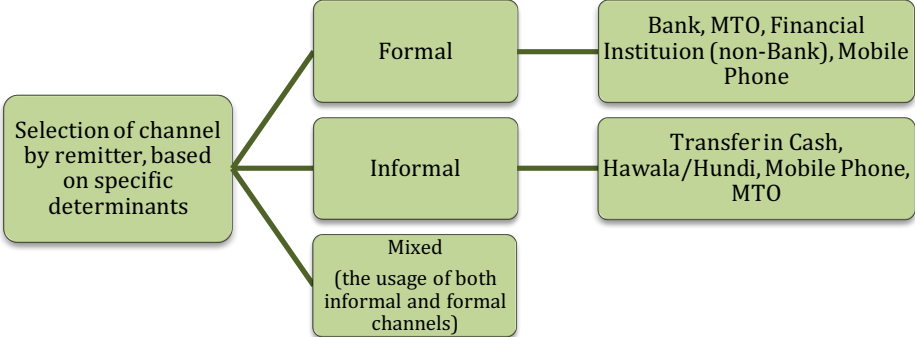
Connected to last sections' discussion of previous research on determinants for selecting a TC, it is evident that there is normally not one single specific factor that decides the outcome. In order to estimate an individual's utility for selecting a certain channel, it is therefore necessary to include a variable representing factors that could have an effect on the selection. From a basic utility model, each respondent's (i) individual utility from choosing a specific channel k can therefore be denoted as:

$$U_{ik} = \psi_j * K_{ik} + \varepsilon_i^U$$

, where K represents potentially explaining factors such as other personal characteristics and specific country-level factors, where ψ denotes a coefficient vector which is dependent on the specific TC, and error term (ε) which is assumed to be independent. In other words, the equation represents the remitters' perceived utility, that is considering perceived potential transaction costs such as efficiency (time), cost and security, from selecting channel k based on a number of different factors.

As previously mentioned, there is a lack of previous research and theory on domestic remittances and the selection of TC. In the pursuit of elucidating this area, there is a need to relate hypotheses to previous existing research and theories on determinants for international remittances. The derived hypotheses are therefore built under the assumption that determinants for domestic transfers resemble those for international transfers.

Methodical Framework

6.1 Analytical Model and Data

In order to analyse the aforementioned relationship between selected variables, large N statistical regressions will be conducted. Given the fact that the dependent variable *"Transfer channel"* is categorical, unordered and non-binary, a multinomial logistic regression (MLR) is deemed to be the most appropriate statistical method since the assumption of the ordinary linear model, that observed data has a linear relationship, is violated. Sample size is >30, which further support the MLR as it normally requires a larger sample than a ordinary least squares (OLS) regression. It would be possible to perform ordinary logistic regressions if the dependent variable where recoded into a binary variable with only two outcomes. However, since respondents in the survey could select more than one channel and since the aim connected to the hypotheses is to estimate likelihood of choosing one type over the other, the MLR is more suitable. A conditional logistic regression could also have been applied but since it is the characteristics of the individual, i. e. educational level, rather than those of the alternatives, that is the focus for the analysis, a MLR is a better fit (Hoffman and Duncan, 1988:416).

The analysis incorporates data from the World Bank- Global Financial Inclusion (Global Findex) 2014 database, which is a rare example of available micro level data containing domestic remittance flows. One of the reasons behind selecting this dataset for analysing the question at hand is that a *direct approach* with household or individual level survey data is deemed most accurate for incorporating the share of informal remittances (Freund and Spatafora, 2005:6). Data from household surveys could also improve accuracy in estimating the attributes of flows and, more specifically, the usage of TC's (International Monetary Fund, 2009:37). It is furthermore not illegal in most countries to receive remittances through informal channels and this decreases any direct incentives that the respondent may have to

conceal information in this area. In this database, which is built on a survey conducted by Gallup Inc., data from 142 countries is accumulated on individuals with approximately 1000 respondents from each country. Data on domestic remittance transfers are not included for all countries, only for developing economies and a few other selected countries. For countries in Europe, data connected to the sector is available for a total of 21 countries[8]. Ten out of these countries are EU member states and these are the same, with the addition of Greece, which are among the ones denoted as *"European receiving countries"* in the aforementioned publication by IFAD, on European remittance flows (IFAD, 2015:10). Target population for the survey was individuals the age of 15 and older from the non-institutionalised civilians. The data was collected through either face-to-face interviews or by telephone and respondents from sampled households where selected through random selection procedure by means of the Kish grid[9].

Unit of analysis is individuals in EU countries for which micro-level data on remittances is available (see Table 1). The decision to only include EU member states is primarily based on three arguments. Firstly, the aim of the study is to analyse the impact from the independent variable on selection of TC in EU countries and it should therefore also be conducted on data from EU countries. Secondly, although included countries had the lowest GDP per capita out of all member states for the period 2013-2015[10] (Eurostat, 2016b), there is still a general difference related to for example technological development and financial inclusion relative to developing countries in other parts of the world and uncovered variables such as for example remittance amount is likely more similar within the EU. Based on this difference between countries under the, in various ways interpreted, term "developing countries", it is also likely that determinants for TC selection are disparate (Freund and Spatafora, 2005:15). Thirdly, although the EU does not have exclusive competence in the field of financial transactions, there are certain directives[11] that are shared for the EU member states, especially connected to AML/CFT. These in turn affect the evolution of banking services and even though they are more directed towards providers than consumers, they indirectly affect the range of channels available for the remitters in EU member states sending domestic remittances.

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[8] European countries with data on remittances were; (EU countries) Bulgaria, Croatia, Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Poland, Romania, Slovak republic, (non-EU countries) Albania, Belarus, Bosnia Herzegovina, Kosovo, Macedonia, Moldova, Russian Federation, Serbia and Ukraine.
[9] Stratified by either geography, population or both.
[10] With the exception of Czech Repulic which had higher GDP per capita than Cyprus, Portugal and Slovenia.
[11] More information in the previous research section under "Remittances and the EU".

Table 2. Selected EU countries with micro level data on remittances and number of valid cases

Country	Valid Cases	Country	Valid Cases
Bulgaria	174	Latvia	250
Croatia	129	Lithuania	142
Czech Republic	151	Poland	123
Estonia	195	Romania	109
Greece	143	Slovak Republic	98
Hungary	106		

Note: Number of valid cases for each country represents the number of respondents who answered yes to the question: "Have you, personally, GIVEN or SENT any of your MONEY to a relative or friend living in a different area INSIDE (country where survey takes place) in the PAST 12 MONTHS? This can be money you brought yourself or sent in some other way."
Data: Global Financial Inclusion (Global Findex) database 2014

For the purpose of this study, selected channels for transfers are the ones denoted in the Global Findex 2014 data, given that this dataset contains micro level data and the fact that the channels represent a comprehensive mix of the common division of informal and formal channels. Each of the respondents in the survey could select from a range of alternative channels constituting (multiple choices where possible); in cash, through an MTO, through a financial institution and through a mobile phone. The selection of channel was preceded with a question connected to if the person had sent domestic remittances sometime during the past 12 months[12].

The main independent variable is *"Educational level"* which is further divided into three different categories: *"Completed primary or less"*, *"Secondary"* and *"Completed tertiary or more"*. In order to further analyse the effect connected to level of education on the dependent variable, other potentially influencing independent variables are included into the regression in order to see if the significance of prediction alters.

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[12] The exact question in the survey can be found in the Annex under "Selected questions from the Global Findex 2014 dataset".

6.1.1 Categorisation of Transaction Channels

Although existing research commonly refers to transaction channels as being either formal or informal, it is as mentioned far from straightforward to pigeonhole the wide variety of available channels. Since the following analysis is on micro level data of limited quantity, seeing as a total of 11 countries are included in the study, channels are sectioned into the categories *"Formal"*, *"Informal"* and *"Mixed"*. The reasoning behind this categorisation is manifold, firstly: the usage of a financial institution or an MMTO is introduced as transfer through an account (if the remitter holds an account at a financial institution or a mobile money account respectively) in the working paper accompanying the Global Findex 2014 dataset (Demirgüç-Kunt et al., 2015:35-36), which in turn is deemed to be a formal method. Secondly, even though transfers via an MTO regularly fall into the group of OTC transactions, it is often grouped with formal channels such as bank transfers (see for example Kosse and Vermeulen, 2014:3,8-9; Barendse et al., 2006:28-30). Each respondent's selection is thereafter divided into one of the aforementioned three categories (which are mutually exclusive and exhaustive), based on if he or she only reported having used formal channels, informal channels or a mix between the two. Even though it should be noted that it is possible for an MTO to be more or less official and regulated, just as for services provided in mobile phone transfers which can be connected to a bank or through a separate MMTO, they still constitute a more formalized and regulated method of transaction than direct cash transfers.

Another divisions is imaginable where *"Financial institution"* and *"Mobile phone"* are denoted as formal channels if the remitter has the previously mentioned account types, where *"MTO"* and, for remitters who does not have an account, *"Financial institution" and "Mobile phone"* are denoted as semi-formal or OTC channels and *"Cash"* as informal channel. This division would however create an increased amount of cells with zero frequencies in the sample at hand and is thus more well suited for a study of larger scope with a higher number of valid observations.

From this division of transaction channels, it is possible to describe each respondent's preference of a certain type of channel relative to another with the following equation[13]:

$$P_{ik} = \frac{exp\ (\psi_k * X_{ik} * V_{ik} + \varepsilon_{ik})}{\sum_{j=1}^{3} exp\ (\psi_j * X_{ik} * V_{ik} + \varepsilon_{ij})}$$

, where P_{ik} is the probability of individual *i* selecting channel *k*, and were $exp\ (\psi_k * X_{ik} * V_{ik} + \varepsilon_{ik})$ represents the individual's derived utility from selecting this type of channel. The ψ_k is a coefficient vector for the given type of channel; the X_{ik} gives the influence connected to education level; the V_{ik} represent other specific factors which may influence the individual's selection (such as personal characteristics and country-specific effects) and the ε_{ik} -term is the error term which is assumed to be independent. The full expression represents the probability that an individual selects channel type *k* relative to the determined baseline category. In the conducted regressions, *"Informal"* comprise the baseline category given the aforementioned general governmental interest in promoting usage of formal channels. The regression therefore estimates the probability of selecting either *"Formal"* or *"Mixed"* over *"Informal"*. Relative odds of selecting one of the other types over the baseline category are thus:

$$P_{ik}/P_{i,\ informal} = exp\ (\psi_k * X_{ik} * V_{ik} + \varepsilon_{ik})$$

As a representation of the respondent's socioeconomic status, the variables "*within economy income*" and "*possibility of coming up with emergency funds*" are included in a second regression to control for other potentially influencing factors[14].

6.2 Recoding and Stepwise Selection

One important assumption connected to the MLR is the independence of irrelevant alternatives (IIA) assumption, which in simplified terms means that the probability of a respondent selecting a certain alternative is independent of any other potential alternative. That is, if another TC category would be introduced, this would not affect the ratio of probabilities between the already available categories (Mc Fadden, Train and Tye, 1981:40). Since this analysis is based on data covering the main TC's available for a remittance transfer,

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[13] Based on the discrete choice model, Multinomial Logit Model (MNL) as described by McFadden (1981).
[14] The exact question, and possible answers, in the survey can be found in the Annex under "Selected questions from the Global Findex 2014 dataset".

it is plausible to assume that there is not a great variety of alternative categories. These channels could also be interpreted in various ways; a respondent selecting the channel *"cash"* could for example either mean a transfer by own means or possibly by using a Hawala agent since the term *"through someone you know"*[15] is somewhat ambiguous. In order to give a less skewed picture of the analysed relationship and to strengthen adherence to the IIA assumption, a stepwise method is applied where only the cases representing a remitter who reported having an account at a financial institution during the selected time period are included. This demarcation is made since even though it is technically possible to use a *"Formal"* channel even if the person does not have an account, it is plausible to assume that this fact is highly relevant for the latter selection of TC given that a respondent who has an account already has access to financial institution services. Other assumptions that need to be met for the MLR are that error terms should be independent and that there should be no multicollinearity. Given the random selection of respondents when collecting the micro-level data, each observation should occupy a high degree of independence and the nature of the main independent variable and the other added independent variables makes multicollinearity unlikely. It is intuitive that there should not be any strong correlation between for example gender, age and educational level on an aggregated level given their fairly static isolated character.

Another potential issue when constructing a logistic regression is that data may be prone to overdispersion, more exactly when observed variance is higher than the model predicts which in turn can create bias when interpreting the b-values. For the purpose of the following analysis, the dispersion parameters will be examined to estimate the risk of overdispersion (Field, 2013:772) and the results of this examination is presented in the "Goodness of fit statistics" section. In order to make the analysis more comprehensive, regressions will follow a stepwise method with the first model including the dependent variable, the main independent variable and two other variables connected to personal characteristics of the remitter. This will then be compared to the second step model, which includes two more variables, *"Within economy income"* and *"Possibility of coming up with emergency funds"*, connected to the respondent's socioeconomic status. It should be noted that even though these variables are ordinal, they are treated as a factor variables in IBM SPSS (statistical software)

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[15]The exact question, and possible answers, in the survey can be found in the Annex under "Selected questions from the Global Findex 2014 dataset".

in order for a MLR to be feasible.

Since the inclusion of the continuous variable representing the respondent's age causes both a high number of cells with zero frequencies and a great disparity between the pseudo R^2 values, the decision was made to recode the age variable into a categorical variable with five different categories representing different age spans[16]. Since this recoding creates a reference category with a low proportion of respondents compared to the others, a total of 6.2 per cent for the *"Age 74 or older"* category, it could be argued that any significant predictions of age as a factor for the selection of TC would merely be down to a smaller sample of individuals aged 74 and older. The decision was therefore made to create another regression to control for potential effects being related to this skewedness. In this regression, unevenness where smoothened out by creating only three age groups to balance out the frequencies (see Appendix, "Output from Multinomial Logistic Regression- Control Regression with Recoded Age Variable").

The "*Gender*" variable was recoded into a variable with 1 signifying male and 2 female and the "*Within economy income*" variable was recoded as an ordinal scale of 1 to 5 with 1 representing the poorest 20 per cent and 5 representing the richest 20 per cent. The other variable representing socioeconomic status, *"Possibility of coming up with emergency funds"* was first transferred into IBM SPSS in the same format as in the dataset with five categories but to facilitate comparison and understanding, it was recoded to the reversed numbers[17]. An initial demarcation was made to only include respondents who during the last 12 months sent domestic remittances[18].

6.3 Quantitative Method

Since the analysis aims at elucidating the area of the effect stemming from a variable X- educational level of the remitter, for the outcome of another variable Y- the selection of TC for a domestic remittance, it lends well to take a quantitative approach to the research question even if this is measured in terms of likelihood ratio as the variables are categorical. General benefits of quantitative analysis are commonly deemed to be that measured quantities

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[16] The divisions into age categories were made as follows: 15-28=1, 29-43=2, 44-58=3, 59-73=4 and 74 and older=5.

[17] More specifically, it was recoded into:1=4, 2=3, 3=2 and 4=1, the rest, 5 and 6, were set as SYSMIS.

[18] The exact question, and possible answers, in the survey can be found in the Annex under "Selected questions from the Global Findex 2014 dataset".

rather than a certain impression is the fundament for interpretation and results, which creates a more solid base for investigating the problem at hand. It is furthermore easier to disperse the results given the possibility to present them in a concise manner with for example graphs and tables (Denscombe, 2009:364). Further benefits of using a quantitative method are that general patterns for different countries and regions can be identified whilst controlling for potentially influential factors and discerning statistical differences in preferences between groups.

6.4 Empirical Challenges

The survey format is, as stated before, beneficial for analysing phenomena connected to remittances when incorporating informal financial transactions. However, there are certain potential drawbacks which needs to be taken into consideration for example that it is difficult to control the verity of the declared responses, especially in cases where interviews where conducted by telephone. There is also the problem with the *interviewer effect,* which means that the characteristics of the interviewer might unintentionally influence the respondent (Denscombe, 2009:269). For the purpose of this study, the problem with the *interviewer effect* should be kept in mind since although interviews were conducted by telephone in countries where telephone coverage for the population were at least 80 per cent, the exception to this rule was made up of those countries where face-to-face interviews were customary methodology. For all of the countries included in this study, face-to-face interviews were conducted, a full summary of the survey methodology can be found in the accompanying Global Findex 2014 working paper (Demirgüc-Kunt et al., 2015:75-82).

As for other types of regression analysis, establishing correlation does not automatically imply the direction of causation. That is, it cannot necessarily be asserted whether it is the independent variable affecting the dependent or vice versa. With this being said, given the character of the variables incorporated in this analysis, the direction of the relationship (likelihood of selecting one over the other) presumably goes from independent to dependent. It is for example not possible for the dependent variable to affect age or gender of a respondent and it is highly unlikely that selecting a certain type of TC influences the individual's educational level. For the variables connected to socioeconomic status, it is less obvious but still plausible that relative income level and possibility of coming up with emergency funds is affecting selection of TC rather than the other way around. This is partly

because our independent variable could be considered "static", a certain decision at certain times over the year whilst the two independent variables could be considered "changeable" and less likely to be affected by isolated events. On a more aggregated level, there is evidence for remittances having a long-term impact for households spending on education. A study by Adams Jr (2005:78) on data for Guatemala captured that households who received domestic remittances spent 45.2 per cent more on education. This is however connected to behaviour of the recipient and on long-term effects rather than selection of TC.

It should also be noted that even though the analysis gives us a more detailed view of the analysed relationship between the independent and dependent variable in the EU, there could still be country level variations not captured in the model. Seeing as this analysis does not include any of the specific countries in the studies mentioned in the previous research section, the final results of the regressions should be regarded more as a complement rather than a substitute and a way to fill the research gap for transfers connected to domestic remittances in the EU. Furthermore, policy adaptations for the promotion of formal channel-usage should therefore ideally be preceded by additional in-depth analysis on the area for the specific country at hand.

All numbers in the following sections are rounded up to a maximum of three decimals except where stated otherwise.

Analysis and Results

Results from the regressions are presented in an aggregated manner in order to ensure respondents anonymity and to uphold the confidentiality requirements stated by the World Bank Group.

7.1 General Characteristics and Frequencies

Below is a summary of the characteristics of respondents in each country, from the Global Findex 2014 dataset, who sent domestic remittances during the last 12 months. As can be seen in Figure 2., all countries except Croatia and Romania had a higher number of female remitters than male. The total number of respondents varied from 98 in the Slovak Republic to 250 in Latvia and the total number of selected cases for each country, after only including

respondents that reported having an account at a financial institution, was generally proportionate to the total population for each as seen in Figure 3[19].

Figure 2.
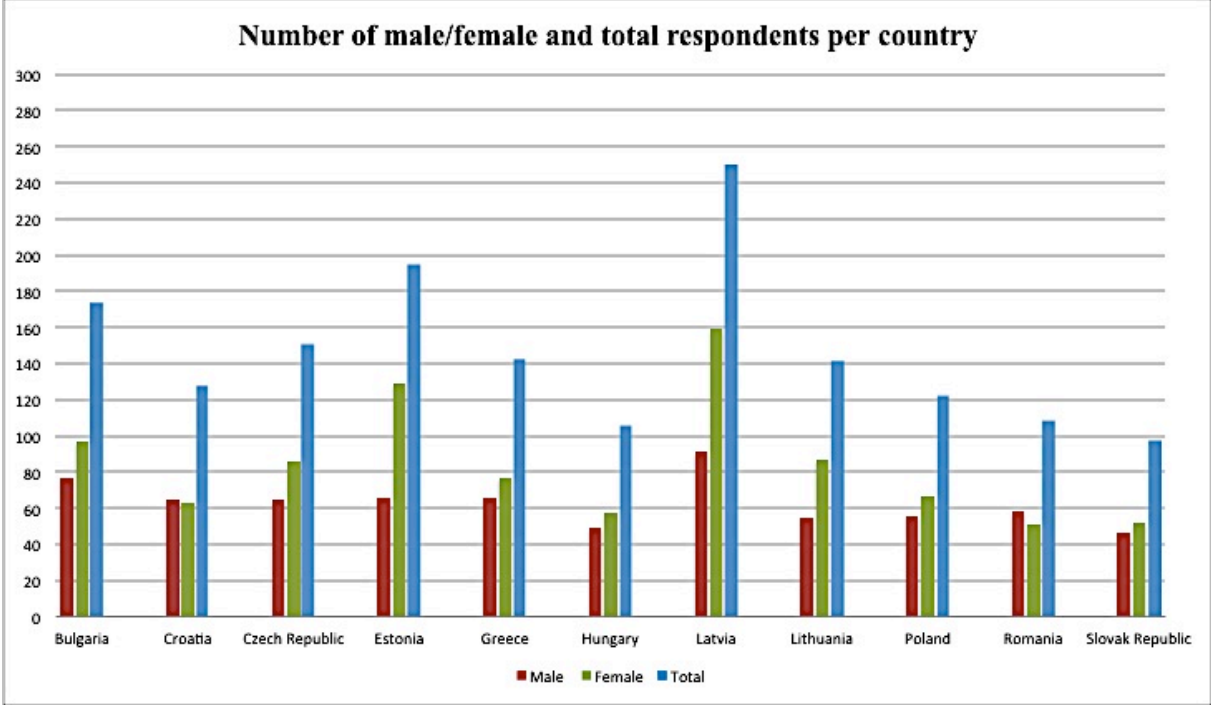
Notes: Graphic representation of the number of respondents from each country, presented by gender and total, who answered "yes" to the question if they had given or sent domestic remittances within the past 12 months. Data retrieved from the Global Financial Inclusion (Global Findex) database 2014.

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[19] Exceptions to this are Romania and Czech Republic which both had a relatively high number of respondents who reported not having an account at a financial institution compared to the total number of remitters, there is however no large discrepancies related to this in the analysis.

Figure 3.
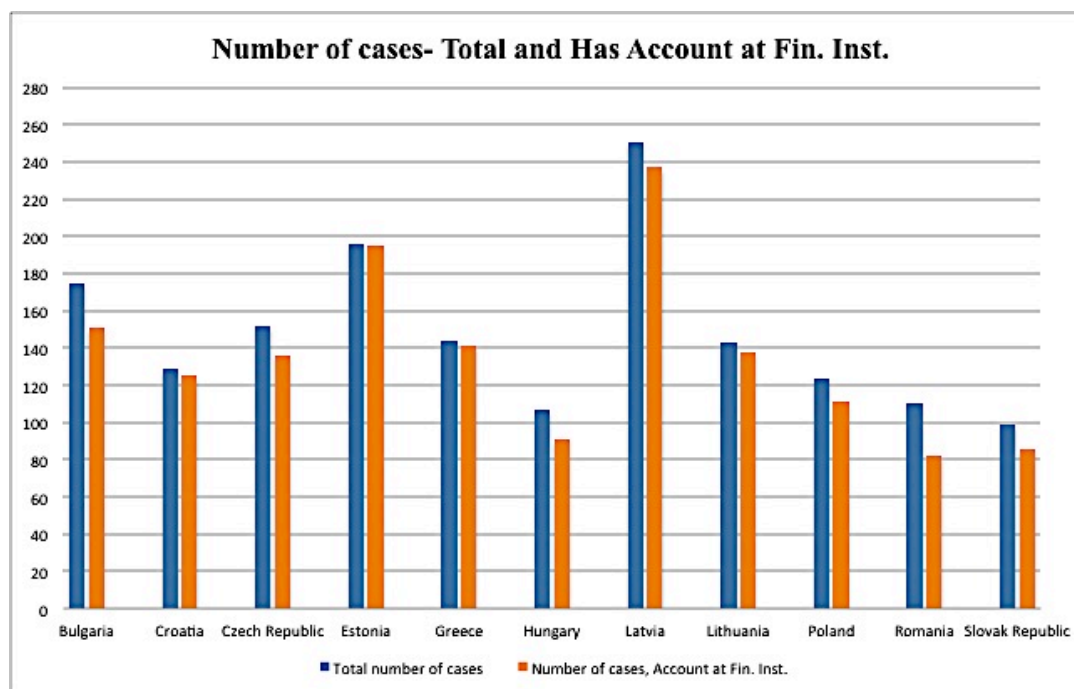
Notes: Graphic representation of the total number of respondents who answered "yes" to the question if they had given or sent domestic remittances within the past 12 months and total number that reported having an account at a financial institution. Data retrieved from the Global Financial Inclusion (Global Findex) database 2014.

As seen in Figure 4., the channel that most remitters in the selected EU member states used for sending domestic remittances were the *"Informal"* with a total of 707 observations[20]. Second most common practise was using formal channels with 426 and the least common were reported to be using a mix of informal and formal methods (a mix between cash and one of the other alternatives) with a total of 305 observations. When examining country-level data, Table 5. gives that this relationship holds for the majority of the included countries but there are some protruding differences. For Estonia and Poland, the type of channel that was most frequently used were *"Formal"* and for Croatia, a mix of both formal and informal channels had the highest within country-frequency at 40 per cent of the Croatian remitters. The country with the largest discrepancies in the remitters selection were Bulgaria where 80 per cent reported having used only informal channels during the past 12 months.

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[20] Out of the ones that answered "yes" to the question if they had an account at a financial institution.

Figure 4.
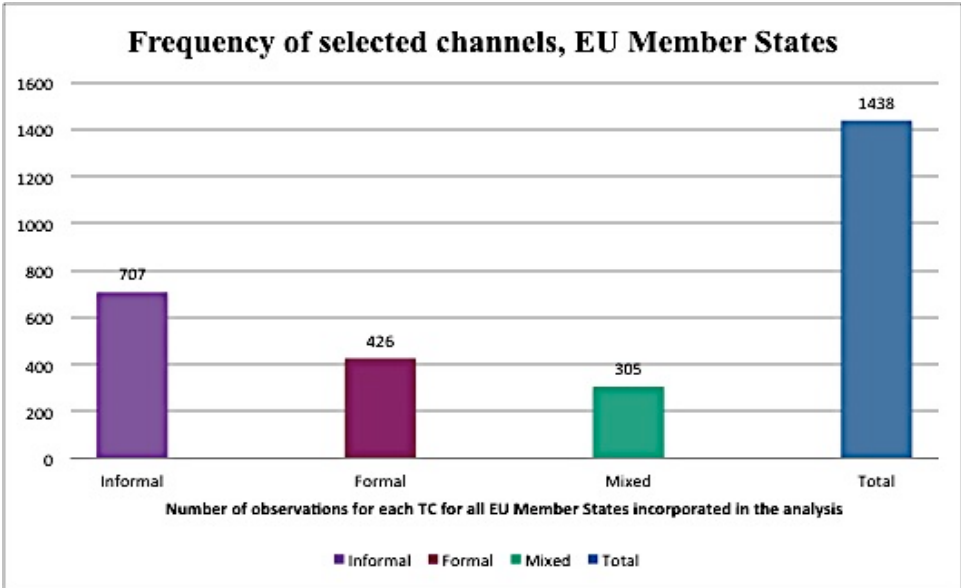
Notes: Graphic representation of number of respondents, who had answered "yes" to the question if they had an account at a financial institution, that selected a certain type of TC and total number of respondents. Data retrieved from the Global Financial Inclusion (Global Findex) database 2014.

Figure 5.
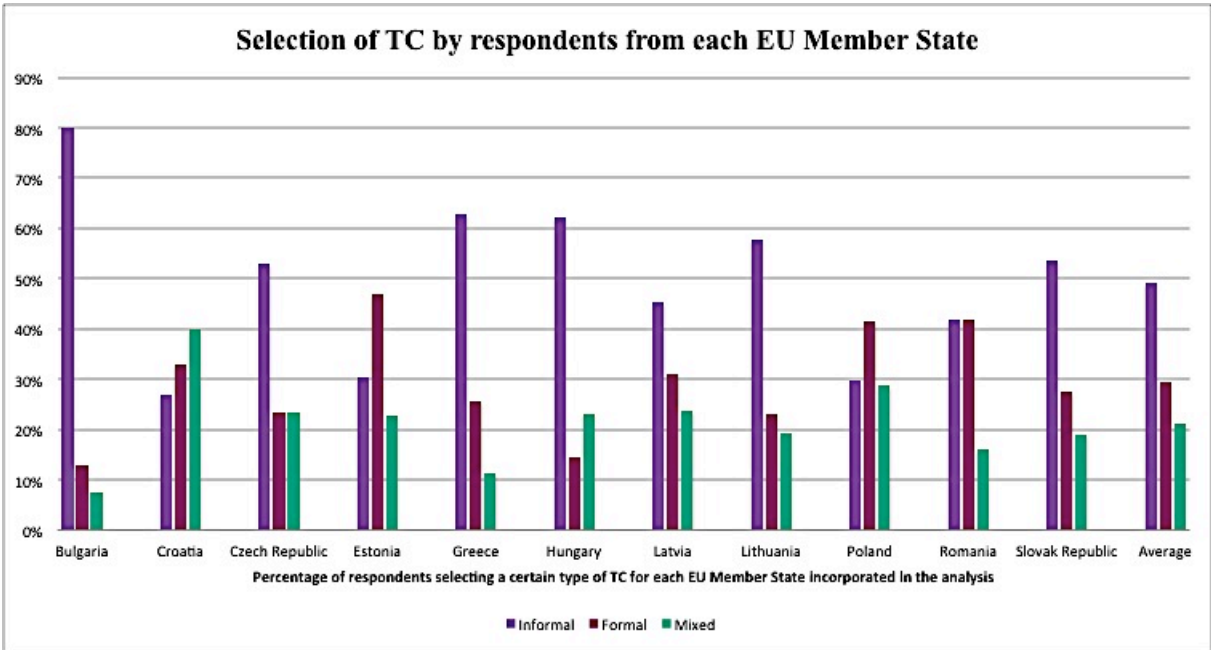

Notes: Graphic representation of percentage of respondents, who had answered "yes" to the question if they had an account at a financial institution, that selected a certain type of TC for each respective EU Member State. Data retrieved from the Global Financial Inclusion (Global Findex) database 2014.

7.2 Results

7.2.1 Model 1. Formal over Informal TC and Mixed over Informal TC

The results from the first MLR can be found in Table 2. In this model, it can be noted that educational level of the remitter significantly predicts, at a p-value of p=.008 for *"Completed primary or less"* and p=.016 for *"Secondary"* the odds of selecting a formal method over an informal relative to the reference category; *"Completed tertiary or more"*. This further capture that the odds of a remitter with completed tertiary education or more to choose a formal channel over an informal is 1/.521= 1.92 times more than for a remitter with completed primary education or less and 1/.722=1.39 times more than for a remitter with secondary education. Gender of the remitter did not significantly predict whether a formal or informal channel was selected, b= -.143 at p>.05. Therefore, the change in the dependent variable associated with the gender changing one unit is not significant for the aforementioned selection.

In addition to these results, the model indicates a strong effect connected to the remitter's age, for remitters in the age group 15 to 28 there is a significant effect at a p-value of <.000, b=1.438 and an odds ratio of 4.213. This means that as the variable age changes from *"Age 15 to 28"* to *"Age 74 or older"* (reference category), the change in odds of choosing a formal compared to an informal channel is 4.213. A similar but slightly lower effect can be seen for the age group *"Age 29 to 43"* where the change in odds is 3.422 at a p-value of <.000 and b=1.203. The model captures a gradual decrease in odds ratio for the *"Age 44 to 58"* and *"Age 59 to 73"* relative to the *"Age 74 or older"* with changes in odds ratio of 2.761 and 1.993 respectively at p-values of p=.002 and p=.039.

The educational level of the remitter significantly predicts the odds of selecting a *"Mixed"* channel over *"Informal"*, for the group *"Completed primary or less"* relative to the reference category, the odds ratio is .496 at a p-value of .017. This means that the odds of a remitter in the category *"Completed tertiary or more"* selecting a *"Mixed"* channel over an *"Informal"* is 2.02 times (1/.496) more than for a remitter who had an educational level of completed primary or less. When looking at a remitter with *"Secondary"* as educational level, the model approximates an odds ratio of .818 relative to the reference category for b= -.201. This result is however not significant since the p-value is p >.05.

In conformity to the role of gender as a predictor for the selection between *"Formal"* and *"Informal"*, the model does not capture any significant relationship, at p<.05, for selecting the *"Mixed"* channel over the *"Informal"* based on gender as a predictor (which can furthermore be seen from the lower and upper limits of the CI crossing 1). A similar pattern as for the importance of a remitter's age for the odds ratio of selecting a *"Formal"* over an *"Informal"* channel can be seen for the selection between *"Mixed"* and *"Informal"*. A significance level of p <.01, can be found for the group *"Age 15 to 28"* relative to the reference category, with an odds ratio of 2.930 and a b-value of 1.075. In the same significance category is the odds ratio for a person from the group *"Age 29 to 43"* relative to the age group *"Age 74 or older"*, selecting a mix of formal and informal channels over informal, at 2.886, b=1.060. The group *"Age 44 to 58"* has an odds ratio of 2.308 at p <.05 and b=.836. Lastly, the remitter's aged 59 to 73 have an odds ratio of .960 relative to the reference category at b= -.041 and p >.05.

Table 3. Multinomial logistic regression no. 1 on selection of TC

Remittance channel	EU- countries	95 % CI for Exp (β)		
	b (SE)	Lower	Odds Ratio	Upper
Formal vs Informal				
Intercept	-1.197*** (.326)			
Education- Completed primary or less	-.652** (.244)	.323	.521	.841
Education- Secondary	-.326* (.135)	.554	.722	.940
Gender- Male	-.143 (.127)	.676	.867	1.112
Age 15 to 28	1.438*** (.344)	2.147	4.213	8.267
Age 29 to 43	1.230*** (.335)	1.776	3.422	6.594
Age 44 to 58	1.016** (.332)	1.442	2.761	5.288

	b (SE)	Lower	Odds Ratio	Upper
Age 59 to 73	.690* (.333)	1.037	1.993	3.829
Mixed vs Informal				
Intercept	-1.387*** (.342)			
Education- Completed primary or less	-.701* (.294)	.279	.496	.883
Education- Secondary	-.201 (.152)	.608	.818	1.102
Gender- Male	.033 (.142)	.783	1.034	1.365
Age 15 to 28	1.075** (.362)	1.440	2.930	5.962
Age 29 to 43	1.060** (.348)	1.458	2.886	5.713
Age 44 to 58	.836* (.345)	1.173	2.308	4.540
Age 59 to 73	-.041 (.362)	.472	.960	1.953

Notes: *Informal* is selected as baseline category. Standard errors within parentheses. N= 1429 R^2= .054 (Cox & Snell), .062 (Nagelkerke). Model $\chi^2 = 79,664$. *p<.05 ** p<.01 ***p<.001. Data: Global Financial Inclusion (Global Findex) database 2014

Table 4. Multinomial logistic regression no. 2 on selection of TC, Inc. socioeconomic variables

Remittance channel	EU- countries	95 % CI for Exp (β)		
	b (SE)	Lower	Odds Ratio	Upper
Formal vs Informal				
Intercept	-1.218** (.355)			
Education- Completed primary or less	-.706** (.258)	.298	.494	.818
Education- Secondary	-.341* (.141)	.539	.711	.937
Gender- Male	-.146	.669	.864	1.116

	(.130)			
Age 15 to 28	1.534*** (.359)	2.292	4.636	9.378
Age 29 to 43	1.317*** (.348)	1.887	3.731	7.378
Age 44 to 58	1.116** (.346)	1.550	3.051	6.006
Age 59 to 73	.802* (.346)	1.131	2.230	4.396
Within economy income- poorest 20 %	-.053 (.240)	.592	.948	1.518
Within economy income- second 20 %	-.098 (.211)	.600	.907	1.371
Within economy income- middle 20 %	-.173 (.187)	.583	.842	1.214
Within economy income- fourth 20 %	-.235 (.170)	.566	.790	1.103
Possibility of coming up with emergency funds- Not at all possible	.474* (.233)	1.018	1.606	2.534
Possibility of coming up with emergency funds- Not very possible	-.027 (.213)	.642	.973	1.477
Possibility of coming up with emergency funds- Somewhat possible	.028 (.147)	.771	1.028	1.370
Mixed vs Informal				
Intercept	-1.060** (.365)			
Education- Completed primary or less	-.509 (.306)	.330	.601	1.096
Education- Secondary	-.130 (.159)	.643	.878	1.200
Gender- Male	-.059 (.146)	.708	.943	1.255
Age 15 to 28	1.042** (.371)	1.370	2.836	5.868

Age 29 to 43	1.037** (.354)	1.411	2.821	5.642
Age 44 to 58	.831* (.351)	1.153	2.297	4.573
Age 59 to 73	-.063 (.368)	.456	.939	1.932
Within economy income- poorest 20 %	.004 (.279)	.582	1.004	1.734
Within economy income- second 20 %	.191 (.228)	.774	1.210	1.891
Within economy income- middle 20 %	-.184 (.219)	.542	.832	1.278
Within economy income- fourth 20 %	-.087 (.190)	.631	.917	1.332
Possibility of coming up with emergency funds- Not at all possible	-.559 (.305)	.315	.572	1.039
Possibility of coming up with emergency funds- Not very possible	-.660** (.254)	.314	.517	.850
Possibility of coming up with emergency funds- Somewhat possible	-.644*** (.170)	.377	.525	.733

Notes: *Informal* is selected as baseline channel. Standard errors within parentheses. N= 1413 R^2= .078 (Cox & Snell), .089 (Nagelkerke). Model χ^2 = 114,734. *p<.05 ** p<.01 ***p<.001. Data: Global Financial Inclusion (Global Findex) database 2014

7.2.2 Model 2. Formal over Informal TC

After extending the model to include variables connected to socioeconomic status, the b-values connected to level of education for selecting a formal over an informal TC changes from b= -.652 for *"Completed primary or less"* to b= -.706 and from b= -.326 for *"Secondary"* to b= -.341, at the same levels of significance (p< .01 and p< .05 respectively). This indicates that even when taking into account socioeconomic factors connected to financial status, the likelihood of a remitter selecting a formal TC over an informal is significantly predicted by educational level of the individual. More precisely, since the b-coefficients are negative for both categories and models, a remitter with lower level of education is less likely relative to a remitter with completed tertiary education or more to

select a formal channel over an informal. It is worth noting that both b-coefficient and significance level are lower when comparing *"Secondary"* to the reference category compared to *"Completed primary or less"* and the reference category, for both models. None of the models approximate that gender significantly predicts whether a remitter would select a formal method over an informal. The odds ratio for a person of male gender to select a *"Formal"* channel over *"Informal"*, relative to a female, is similar to the ratio in Model 1., a change from Exp (B)=.867 to Exp (B)=.864 and b= -.143 to b= -.146, at p> .05.

Similar to Model 1, the age variable for all four categories have, on average, low but increasing p-values and depicts that a younger remitter is more likely to select a formal TC over an informal relative to the reference category *"Age 74 and older"*. The category *"Age 15 to 28"* has an odds ratio of 4.636 at p< .000 and b= 1.534 which tells us that remitters aged 15 to 28 are more likely than those aged 74 and older to use a formal TC over an informal. Worth noting is that the generally low p-values in relation to the likelihood connected to the age group of the respondent remains, although some changes have occurred. For the category *"Age 29 to 43"*, the odds ratio relative to the reference category is 3.731 at p< .000 and b= 1.317. The model also captures that age of the remitter significantly predicts, at p< .01 and b=1.116, whether a formal channel would be selected over an informal for remitters in the age group *"Age 44 to 58"* relative to remitters aged 74 or older. The last (oldest) included age category, *"Age 59 to 73"* have an odds ratio of 2.230 and b= .802 at p< .05. Even though the prediction of selecting a formal channel over an informal also is significant for this group, it is evident that significance level is abating for higher (older) age categories, albeit the direction is the same.

The model approximates negative and decreasing b-coefficients for the first added variable connected to socioeconomic factors, *"Within economy income"*, which indicates that all income groups relative to the reference category *"Within economy income- richest 20%"* are less likely to select a formal channel over an informal, with the largest effect between the group *"Within economy income- fourth 20%"* and the reference category with an odds ratio of 1.27 (1/0.790) for a person within the richest 20th percentile in the country (measured as monthly household income before tax) selecting a formal over informal TC relative to remitters in the fourth 20th percentile. However, none of the b-coefficients estimated in Model 2 connected to this variable have a significance level of p< .05 and the CI spans over 1

for all which indicates that the variable does not significantly predict whether one or the other of the categories is more or less likely to select a formal TC over an informal.

For the second added socioeconomic variable, *"Possibility of coming up with emergency funds"*, the respondents in category *"Possibility of coming up with emergency funds- Not at all possible"* were more likely than those in the reference category to select a formal TC over an informal at $p < .05$ and $b = .474$. For the other two groups, *"Possibility of coming up with emergency funds- Not very possible"* and *"Possibility of coming up with emergency funds- Somewhat possible"*, the model did not capture any significant b-values at $p < .05$ connected to the likelihood of a remitter in these groups selecting a formal TC over an informal relative to the ones in the group constituting remitters who responded having the highest possibility of coming up with emergency funds.

7.2.3 Model 2. Mixed over Informal TC

The prediction of a remitter in the education category *"Completed primary or less"* selecting a mix of channels over purely informal relative to the reference category weakens when socioeconomic variables are added, b-coefficients changes from $b = -.701$ to $b = -.509$ and p-value from $p < .05$ to $p > .05$. Odds ratio of a remitter with secondary education selecting a mix over just informal channels relative to the reference category is slightly higher at Exp (B)=.878 but both Model 1 and Model 2 has a p-value of $p > .05$ for this variable which depicts that there is no significant prediction of selecting a mix of TC's over informal from educational level of secondary to completed tertiary or more. Gender of the remitter is still not significantly predicting whether a mix of TC's is selected over informal, at $b = -.059$ and $p > .05$.

Even when including the new variables in Model 2, the age variable is on average significantly predicting whether the remitter would select a mix of TC's over informal, with a decreased significance level for higher (older) age groups relative to the reference category. As the age of the remitter changes from *"Age 15 to 28"* to *"Age 74 or older"*, the odds ratio is 2.836 for selecting mixed TC's over only informal, at $p < .01$ and $b = 1.042$. For the age groups *"Age 29 to 43"* and *"Age 44 to 58"*, the odds ratios relative to the reference category are 2.821 and 2.297 respectively at $p < .01$, $b = 1.037$ for the first and $p < .05$, $b = .831$ for the second. This captures that Model 2 predicts that a remitter in the lower (younger) age groups

is significantly more likely to select a mix of TC's over informal channels relative to the oldest age group. The pattern can however not be seen for the age group *"Age 59 to 73"* relative to the reference category as the b-value is negative at b= -.063 and p> .05.

The new variable *"Within economy income"* does not significantly predict whether a mix of TC's is selected over only informal TC's, at a p-value of p< .05, for any of the income categories. It is therefore not possible to say, based on the outcome of the model, if the relative household income level of a remitter increases or decreases the likelihood of selecting a mix between formal and informal TC's relative to exclusively informal. The other variable connected to socioeconomic status, *"Possibility of coming up with emergency funds"*, significantly predicts the selection between a mix of informal and formal TC's over only informal when relating the categories *"Possibility of coming up with emergency funds- Not very possible"* and *"Possibility of coming up with emergency funds- Somewhat possible"* to the reference category of *"Possibility of coming up with emergency funds- Very possible"*. Remitters who responded that it was "not very possible" for them to come up with emergency funds were significantly less likely than those in the reference category to select a mix of informal and formal TC's over purely informal, at p< .01, b= -.660. An even higher level of significance were connected to the prediction whether remitters who responded that it was "somewhat possible" for them to come up with emergency funds relative to those who responded that this was "very possible", would select a mix of informal and formal TC's over purely informal, at p< .001 and b= -.644. The odds of a remitter, who responded that it was "very possible" to come up with emergency funds, selecting a mix of informal and formal TC's over only informal were 1.90 times (1/.525) higher than for one who stated being "somewhat possible".

7.3 Goodness-of-fit Statistics

In the goodness-of-fit statistics, it can be noted that the dispersion parameters for Pearson and Deviance (residual deviance) are similar in value in Model 1 at a Pearson dispersion parameter of .833 (36.671/44) with p> .05 and a Deviance dispersion parameter of .905 (39.808/44) with p> .05. For Model 2, both the Pearson dispersion parameter and the Deviance dispersion parameter are very close to the ideal value of 1 at 1.069 (761.198/712) with p> .05 and 1.147 (816.464/712) with p> .001 respectively. This indicates that there is no substantial sign of overdispersion in the data. It should however be noted that the Deviance

dispersion parameter in Model 2 is significant at p< .01 but given proximity to the ideal value and the fact that there is no alarming concern connected to high standard errors, it is likely that this is due to the fact that the model has 42.9 per cent cells with zero frequencies which is common when including many covariates (Field, 2013: 806-808). In addition to this, the Pearson measure is often deemed to be the choice of preference given its moment estimator character (Smyth, 2003:115).

The pseudo R^2 Cox and Snell measure of .078 is close to the pseudo R^2 Nagelkerke measure of .089 in Model 2 and even though they could not be seen as representing a large sized effect, they mark an improvement from the previous model, which did not include the socioeconomic variables, regarding the fit of the model to the data. For Model 1, the Cox and Snell measure was .054 and the Nagelkerke .062. The chi-square tests in both models depicts that the model explains a significant amount of original variability at $\chi^2 = 79.664$ in Model 1 and $\chi^2 = 114.734$ in Model 2 at p< .000 for both, relative to an intercept-only model.

7.4 Analysis

Based on the results of the multinomial logistic regressions, it can be noted that the educational level of a remitter significantly predicts whether a formal TC is selected over an informal and that this prediction holds up when including socioeconomic variables. A remitter with a lower level of education is less likely than one with a higher level of education to select a formal TC over an informal. The strength of this prediction is however weaker for higher levels of education such as completed secondary relative to completed tertiary or more. This finding supports, to some extent, the research by Siegel and Lücke (2013) that there are differences in the strength of education as a predictor for different levels but as opposed to their research, these models predict a significant effect also between secondary and higher levels of education. For the selection of a mix of formal and informal channels over purely informal, level of education does not have the same significant prediction as for the former selection but a small effect can be seen for the group or remitters who reported having completed only primary education or less relative to those in the highest education level group. With this being said, the b-values for the selection between mixed methods over informal are also negative and similar in size which indicates that effect size is comparable but that the lack of significance for all but one category likely stems from comparatively higher standard errors.

As for the other variables, the gender of a remitter does not significantly predict the likelihood of selecting either a formal TC over an informal or a mix of formal and informal TC's over just informal. This is in line with Kosse and Vermeulen (2014:20,33), who finds that gender as a stand-alone variable is insignificant for the prediction but somewhat contradicting the findings by Siegel and Lücke (2013:136), who approximated that a male remitter was less likely to select an informal channel relative to a formal. This being said, it should be noted that they contemplate the improbability of gender affecting the choice of TC and that their results could be linked to other explanatory variables connected to for example migratory patterns.

Educational level of the remitter is, however, not the variable with the most significant prediction of the selection of TC. From the models, it can be derived that the age of a remitter in the EU member state significantly predicts whether a formal channel is selected over an informal. Furthermore, this variable is even more significantly predicting the choice in comparison with the effect size connected to educational level, at p-values of p< .000 for the two categories *"Age 15 to 28"* and *"Age 29 to 43"* for both models. When comparing the remaining two age categories, the significance level decreases but the prediction still remains significant for remitters aged 44 to 58 and 59 to 78 relative to the reference category, at p-values of p< .01 and p< .05 respectively. Given the fact that the b-values are positive, this means that younger remitters in the selected EU countries are more likely to select a formal over an informal TC for domestic remittances. The effect size is even stronger when comparing the younger age groups to the oldest with for example 1.438 and 1.230 as b-values for the two youngest age categories and 1.016 and .690 for the other two, in Model 1. It can also be seen that the aforementioned values increase for all categories as socioeconomic variables are added. The relationship between the significance of age predicting selection of a formal channel rather than an informal could furthermore be connected to the previously mentioned earlier adoption of new technology by younger individuals (Koenig-Lewis et al., 2010). For the selection between mixed TC's and only informal, the age variable is still significantly predicting the likelihood of selecting mixed over informal but the significance of the predictions are, on average, lower than for the selection between formal and informal.

It could, as mentioned before, be argued that the significant predictions of age as a factor for the selection of TC is merely down to a lower amount of individuals aged 74 and older, since

they represent the reference category, but when controlling for this by reducing the number of age groups in order to balance out the ratios, significance for the prediction holds up (see Appendix, Output from Multinomial Logistic Regression- Control regression with recoded age variable). The b-values for the age categories are significantly predicting the selection at p-values of $p<.000$ and $p<.002$ for formal over informal and at $p<.000$ and $p<.000$ for mixed over informal.

The variables only included in Model 2, connected to socioeconomic status of the remitter does not, on average, significantly predict whether a formal method is selected over an informal and this result is somewhat surprising given the fact that individuals with higher income should, theoretically, be less sensitive to the higher costs often incurred when using a formal TC, ceteris paribus. This phenomena could be explained by other potentially explaining factors such as cultural disparities, as discussed by Hernández-Coss (2005), a discrepancy in the data set with few people belonging to the lowest income category and the fact that everyone representing an observation in the dataset has an account at a financial institution.

7.4.1 Discussion on Domestic Remittances

The prevalence of the constructed definition of remittances as international flows may be a limiting factor to the initiative for new research within the field. Given the aforementioned importance of domestic remittance flows, in particular the relatively higher likelihood of receiving a national transfer over an international as mentioned by Esipova et. al. (2013), this is an unfortunate demarcation that could prevent new insights and that may affect resources available to policymakers in their attempts to harvest the potential net benefits of these financial flows. It is thus of great importance that research within this field is developed and that the European region in general and the EU in particular are further explored, not only as sender of international aid in the form of remittances, but also internal flows of domestic remittances. Increased analysis on the selection of TC should furthermore not be seen as an isolated area but rather complementing research on underlying determinants for the initial decision to remit.

Given the relatively recent development of mobile banking and online financial transaction services (for the average citizen), the significant predictions of likelihood for TC selection

connected to the remitter's age should depend on future technological development within the field. When younger generations, who are today using technological services in this area to a larger extent, grow up; the difference might be evened out but given the rapid expansion within the field, it is more likely that the gap will persist.

When comparing the impact stemming from educational level for selection of TC for international remittances with this foundational research on domestic remittances, it is worth pointing out that previous research supporting an existing correlation, for example Siegel and Lücke (2013) and Kosse and Vermeulen (2014), has targeted European countries. Research that has failed to approximate any significant prediction, such as by Amjad et al. (2013), has focused on non-European countries. This could indicate, especially considering the new findings brought forward by this analysis, regional differences where the correlation between educational level as a predictor is, on average, stronger for European countries in general and in particular for EU member states. Interpreting this phenomenon should nonetheless be done with caution since the research on selection of TC for remittances is still in its cradle, above all for domestic remittances.

7.4.2 Policy Implications

In order to create and implement successful policy provisions to promote the usage of formal over informal TC's, it is imperative to understand the main drivers for selecting one over the other. Based on the results from the analysis, investments in the educational sector to increase access to education and thereby the general educational level of the population could serve as a complement for increasing the usage of formal transaction channels in the long run. With regards to the current predominant usage of informal channels in the EU member states with a high number of remitters, it will be a challenge for the future to encourage adoption of formal channels. Albeit this movement towards formalization of channels and the desired increased usage of formal ones, cash based transfer may have its advantages as suggested by Passas (2016) and any provisions or regulation within the area should therefore arguably be context-sensitive.

Furthermore, the prevailing global view on remittances as a potential means for poverty alleviation and financial development connected to transfers to developing countries is in the EU matched by referral to remittances in relation to preventing illegal activities. Directives

aimed at preventing for example money laundering and the financing of terrorism should optimally be sensitive to the specific nature of remittances and the difference in character between domestic and international transfers. As can be seen from this analysis relating to the limited amount of previous empirical research within the field, both types exhibit similar traits when it comes to personal characteristics as determinants for selecting TC, such as age and educational level but given the lack of specified analysis on domestic flows, further research is needed.

Unfolding the remitter's reasoning behind selection of TC is not only useful for policy adaptations connected to the promotion of formal channels, new insights could serve as valuable material for examining the positive impact from domestic remittances. Previous studies by researchers such as Adams Jr and Page (2005) and Aggarwal et al. (2006) on the power of remittances to reduce poverty and stimulate economic development could then be complemented by the impact from domestic flows given the usage of a specific channel.

Conclusions

The specified aim of this thesis was to analyse the role of educational level for selection of TC for domestic remittance in EU member states. From the conducted analysis, it can be noted that educational level of the remitter does have an effect in significantly predicting the selection of a formal TC over an informal. Even though this effect is approximated, the models capture that there are other variables such as age that have an even grander impact. Governments in the selected EU member states should therefore take into account educational level as a factor for promoting the usage of formal channels for domestic remittance transfers but should also be aware of potentially complementary factors, which could also influence the remitter's selection. As age is a "static" variable, policy adaptations in connection to this result should technically aim at encouraging the usage of formal channels for older individuals. It should however be noted that it is a lower percentage of individuals in the older age groups, on average, who sends remittances to begin with so any impact from an increased usage of formal channels by older citizens may be marginal.

Based on the above mentioned, the H_1 hypothesis, that a higher level of education of the remitter increases the preference for selecting a formal TC (financial institution, MTO or mobile phone) over an informal channel for domestic EU remittance transfers, is retained. The

H$_2$ hypothesis, that a higher level of education of the remitter increases the preference for selecting a mix of informal and formal channels for domestic remittance transfers over an informal (cash transfer) channel, must be rejected. Even though Model 1 captures a significant prediction for the *"Education-Completed primary or less"* group in the selection between a mix of channels over only informal, the significance for this prediction is lost when including the other explanatory variables of socioeconomic nature.

Since the Global Findex 2014 survey encompassing micro data on remittances for respondents from several countries will be conducted again in 2017, incorporating the same variables for domestic remittances, it would be of great interest to conduct a new analysis on this material to see whether the same patterns as for 2014 can be identified. It would furthermore be of value to further analyse the underlying determinants for selection of TC's on a wider perspective to further facilitate governmental action to promote the usage of formal channels. Given the somewhat diverging views on determinants for selection of TC for a domestic remittance transfer in general, and the role of educational level in particular, it would also be beneficial to conduct further studies on country level data with large samples. This would elucidate regional differences and benefit governmental support for the furthering of formal TC usage.

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Appendix

10.1 Reference categories in regressions

10.1.1 Model 1.

- Education- Completed tertiary or more
- Gender- Female
- Age- 74 or older

10.1.2 Model 2.

- Education- Completed tertiary or more
- Gender- Female
- Age- 74 or older
- Within economy income, richest 20%
- Possibility of coming up with emergency funds- Very possible

10.2 Selected questions from the Global Findex 2014 dataset

Name	Label	Type	Format	Question	Available Answers
				Indicators	
female	Respondent is female	Discrete	Numeric	Interviewer coded	[Interviewer coded] 1Male 2 female
age	Respondent age	Discrete	Numeric	Please tell me your age	15 through 99
educ	Respondent education level	Discrete	Numeric	What is your highest completed level of education?	1= completed primary or less, 2=secondary, 3=completed tertiary or more, 4=(dk), 5=(rf)
inc_q	Within-economy household income quintile	Discrete	Numeric	What is your total MONTHLY household income in [insert local currency], before taxes? Please include income from wages and salaries, remittances from family members living elsewhere, farming, and all other sources.	1= poorest 20%, 2= second 20%, 3= middle 20%, 4= fourth 20%, 5=richest 20%

account_fin	Has an account at a financial institution	Discrete	Numeric	Composite indicator	1= yes, 2= no, 3=dk/ref
q24	Possibility of coming up with emergency funds	Discrete	Numeric	Now, imagine that you have an emergency and you need to pay [insert 1/20 of GNI per capita in local currency]. How possible is it that you could come up with [insert 1/20 of GNI per capita in local currency] within the NEXT MONTH? Is it very possible, somewhat possible, not very possible, or not at all possible? (Read 1-4)	1= very possible, 2= somewhat possible, 3= not very possible, 4= not at all possible, 5= (dk), 6= (refused)
q26	Sent domestic remittances in past 12 months	Discrete	Numeric	Have you, personally, GIVEN or SENT any of your MONEY to a relative or friend living in a different area INSIDE (country where survey takes place) in the PAST 12 MONTHS? This can be money you brought yourself or sent in some other way.	1= yes, 2= no, 3= (dk), 4= (ref)
q27a	If sent domestic remittances: in cash	Discrete	Numeric	In the PAST 12 MONTHS, have you, personally, GIVEN or SENT money to a relative or friend living in a different area inside (country where survey takes place) in any of the following ways? You handed cash to this person or sent cash through someone you know.	1= yes, 2= no, 3= (dk), 4= (ref)
q27b	If sent domestic remittances: through a financial institution	Discrete	Numeric	In the PAST 12 MONTHS, have you, personally, GIVEN or SENT money to a relative or friend living in a different area inside (country where survey takes place) in any of the following ways? You sent money through a bank or another type of formal financial institution (for example, at a branch, at an ATM, or through direct deposit into an account).	1= yes, 2= no, 3= (dk), 4= (ref)
q27c	If sent domestic remittances: through a mobile phone	Discrete	Numeric	In the PAST 12 MONTHS, have you, personally, GIVEN or SENT money to a relative or friend living in a different area inside (country where survey takes place) in any of the following ways? You sent money through a mobile phone.	1= yes, 2= no, 3= (dk), 4= (ref)

q27d	If sent domestic remittances: through an MTO	Discrete	Numeric	In the PAST 12 MONTHS, have you, personally, GIVEN or SENT money to a relative or friend living in a different area inside (country where survey takes place) in any of the following ways? You sent money through a money transfer service.	1= yes, 2= no, 3= (dk), 4= (ref)

10.3 Frequency table for selection of TC, Crosstabulation

Economy (EU) * Transfer_chann_lst Crosstabulation

			Transfer_chann_lst			Total
			Informal	Formal	Mixed	
Economy (EU)	Bulgaria	Count	119	19	11	149
		% within Economy (EU)	79,9%	12,8%	7,4%	100,0%
	Croatia	Count	31	38	46	115
		% within Economy (EU)	27,0%	33,0%	40,0%	100,0%
	Czech Republic	Count	70	31	31	132
		% within Economy (EU)	53,0%	23,5%	23,5%	100,0%
	Estonia	Count	59	91	44	194
		% within Economy (EU)	30,4%	46,9%	22,7%	100,0%
	Greece	Count	88	36	16	140
		% within Economy (EU)	62,9%	25,7%	11,4%	100,0%
	Hungary	Count	51	12	19	82
		% within Economy (EU)	62,2%	14,6%	23,2%	100,0%
	Latvia	Count	105	72	55	232
		% within Economy (EU)	45,3%	31,0%	23,7%	100,0%
	Lithuania	Count	78	31	26	135
		% within Economy (EU)	57,8%	23,0%	19,3%	100,0%
	Poland	Count	30	42	29	101
		% within Economy (EU)	29,7%	41,6%	28,7%	100,0%
	Romania	Count	31	31	12	74
		% within Economy (EU)	41,9%	41,9%	16,2%	100,0%
	Slovak Republic	Count	45	23	16	84
		% within Economy (EU)	53,6%	27,4%	19,0%	100,0%
Total		Count	707	426	305	1438
		% within Economy (EU)	49,2%	29,6%	21,2%	100,0%

10.4 Output from Multinomial Logistic Regression- Model 1.

Case Processing Summary

		N	Marginal Percentage
Transfer_chann_lst	Informal	704	49,3%
	Formal	425	29,7%
	Mixed	300	21,0%
education_rec	completed primary or less	135	9,4%
	secondary	804	56,3%
	completed tertiary or more	490	34,3%
gender_rec	male	616	43,1%
	female	813	56,9%
age_rec_cat	15-28	228	16,0%
	29-43	355	24,8%
	44-58	420	29,4%
	59-73	337	23,6%
	74 and older	89	6,2%
Valid		1429	100,0%
Missing		53	
Total		1482	
Subpopulation		30	

Model Fitting Information

	Model Fitting Criteria	Likelihood Ratio Tests		
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	321,903			
Final	242,239	79,664	14	,000

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	36,671	44	,776
Deviance	39,808	44	,652

Pseudo R-Square

Cox and Snell	,054
Nagelkerke	,062
McFadden	,027

Likelihood Ratio Tests

Effect	Model Fitting Criteria -2 Log Likelihood of Reduced Model	Likelihood Ratio Tests Chi-Square	df	Sig.
Intercept	242,239[a]	,000	0	.
education_rec	254,936	12,697	4	,013
gender_rec	243,972	1,733	2	,420
age_rec_cat	298,067	55,828	8	,000

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Parameter Estimates

Transfer_chann_lst[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B) Lower Bound	Upper Bound
Formal	Intercept	-1,197	,326	13,496	1	,000			
	[education_rec=1]	-,652	,244	7,127	1	,008	,521	,323	,841
	[education_rec=2]	-,326	,135	5,838	1	,016	,722	,554	,940
	[education_rec=3]	0[b]	.	.	0	.	.	.	.
	[gender_rec=1]	-,143	,127	1,266	1	,260	,867	,676	1,112
	[gender_rec=2]	0[b]	.	.	0	.	.	.	.
	[age_rec_cat=1]	1,438	,344	17,486	1	,000	4,213	2,147	8,267
	[age_rec_cat=2]	1,230	,335	13,509	1	,000	3,422	1,776	6,594
	[age_rec_cat=3]	1,016	,332	9,385	1	,002	2,761	1,442	5,288
	[age_rec_cat=4]	,690	,333	4,281	1	,039	1,993	1,037	3,829
	[age_rec_cat=5]	0[b]	.	.	0	.	.	.	.
Mixed	Intercept	-1,387	,342	16,488	1	,000			
	[education_rec=1]	-,701	,294	5,678	1	,017	,496	,279	,883
	[education_rec=2]	-,201	,152	1,748	1	,186	,818	,608	1,102
	[education_rec=3]	0[b]	.	.	0	.	.	.	.
	[gender_rec=1]	,033	,142	,056	1	,813	1,034	,783	1,365
	[gender_rec=2]	0[b]	.	.	0	.	.	.	.
	[age_rec_cat=1]	1,075	,362	8,801	1	,003	2,930	1,440	5,962
	[age_rec_cat=2]	1,060	,348	9,261	1	,002	2,886	1,458	5,713
	[age_rec_cat=3]	,836	,345	5,868	1	,015	2,308	1,173	4,540
	[age_rec_cat=4]	-,041	,362	,013	1	,910	,960	,472	1,953
	[age_rec_cat=5]	0[b]	.	.	0	.	.	.	.

a. The reference category is: Informal.

b. This parameter is set to zero because it is redundant.

10.5 Output from Multinomial Logistic Regression- Model 2.

Case Processing Summary

		N	Marginal Percentage
Transfer_chann_lst	Informal	694	49,1%
	Formal	422	29,9%
	Mixed	297	21,0%
education_rec	completed primary or less	133	9,4%
	secondary	795	56,3%
	completed tertiary or more	485	34,3%
gender_rec	male	608	43,0%
	female	805	57,0%
age_rec_cat	15-28	224	15,9%
	29-43	352	24,9%
	44-58	417	29,5%
	59-73	332	23,5%
	74 and older	88	6,2%
within_eco_inc_rec	1	126	8,9%
	2	188	13,3%
	3	258	18,3%
	4	327	23,1%
	5	514	36,4%
pos_eme_funds	not at all possible	122	8,6%
	not very possible	162	11,5%
	somewhat possible	449	31,8%
	very possible	680	48,1%
Valid		1413	100,0%
Missing		69	
Total		1482	
Subpopulation		371[a]	

a. The dependent variable has only one value observed in 184 (49,6%) subpopulations.

Model Fitting Information

Model	Model Fitting Criteria -2 Log Likelihood	Likelihood Ratio Tests Chi-Square	df	Sig.
Intercept Only	1463,519			
Final	1348,785	114,734	28	,000

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	761,198	712	,098
Deviance	816,464	712	,004

Pseudo R-Square

Cox and Snell	,078
Nagelkerke	,089
McFadden	,039

Likelihood Ratio Tests

Effect	Model Fitting Criteria -2 Log Likelihood of Reduced Model	Likelihood Ratio Tests Chi-Square	df	Sig.
Intercept	1348,785[a]	,000	0	.
education_rec	1359,563	10,778	4	,029
gender_rec	1350,040	1,255	2	,534
age_rec_cat	1403,165	54,380	8	,000
within_eco_inc_rec	1353,073	4,288	8	,830
pos_eme_funds	1376,610	27,825	6	,000

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Parameter Estimates

Transfer_chann_lst[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
Formal	Intercept	-1,218	,355	11,761	1	,001			
	[education_rec=1]	-,706	,258	7,489	1	,006	,494	,298	,818
	[education_rec=2]	-,341	,141	5,844	1	,016	,711	,539	,937
	[education_rec=3]	0[b]	.	.	0	.	.	.	.
	[gender_rec=1]	-,146	,130	1,252	1	,263	,864	,669	1,116
	[gender_rec=2]	0[b]	.	.	0	.	.	.	.
	[age_rec_cat=1]	1,534	,359	18,217	1	,000	4,636	2,292	9,378
	[age_rec_cat=2]	1,317	,348	14,334	1	,000	3,731	1,887	7,378
	[age_rec_cat=3]	1,116	,346	10,420	1	,001	3,051	1,550	6,006
	[age_rec_cat=4]	,802	,346	5,361	1	,021	2,230	1,131	4,396
	[age_rec_cat=5]	0[b]	.	.	0	.	.	.	.
	[within_eco_inc_rec=1]	-,053	,240	,049	1	,824	,948	,592	1,518
	[within_eco_inc_rec=2]	-,098	,211	,214	1	,643	,907	,600	1,371
	[within_eco_inc_rec=3]	-,173	,187	,851	1	,356	,842	,583	1,214
	[within_eco_inc_rec=4]	-,235	,170	1,913	1	,167	,790	,566	1,103
	[within_eco_inc_rec=5]	0[b]	.	.	0	.	.	.	.
	[pos_eme_funds=1]	,474	,233	4,152	1	,042	1,606	1,018	2,534
	[pos_eme_funds=2]	-,027	,213	,016	1	,899	,973	,642	1,477
	[pos_eme_funds=3]	,028	,147	,036	1	,849	1,028	,771	1,370
	[pos_eme_funds=4]	0[b]	.	.	0	.	.	.	.
Mixed	Intercept	-1,060	,365	8,453	1	,004			
	[education_rec=1]	-,509	,306	2,763	1	,096	,601	,330	1,096
	[education_rec=2]	-,130	,159	,666	1	,415	,878	,643	1,200
	[education_rec=3]	0[b]	.	.	0	.	.	.	.
	[gender_rec=1]	-,059	,146	,163	1	,686	,943	,708	1,255
	[gender_rec=2]	0[b]	.	.	0	.	.	.	.
	[age_rec_cat=1]	1,042	,371	7,892	1	,005	2,836	1,370	5,868
	[age_rec_cat=2]	1,037	,354	8,603	1	,003	2,821	1,411	5,642
	[age_rec_cat=3]	,831	,351	5,597	1	,018	2,297	1,153	4,573
	[age_rec_cat=4]	-,063	,368	,029	1	,864	,939	,456	1,932
	[age_rec_cat=5]	0[b]	.	.	0	.	.	.	.
	[within_eco_inc_rec=1]	,004	,279	,000	1	,987	1,004	,582	1,734
	[within_eco_inc_rec=2]	,191	,228	,699	1	,403	1,210	,774	1,891
	[within_eco_inc_rec=3]	-,184	,219	,708	1	,400	,832	,542	1,278
	[within_eco_inc_rec=4]	-,087	,190	,207	1	,649	,917	,631	1,332
	[within_eco_inc_rec=5]	0[b]	.	.	0	.	.	.	.
	[pos_eme_funds=1]	-,559	,305	3,360	1	,067	,572	,315	1,039
	[pos_eme_funds=2]	-,660	,254	6,745	1	,009	,517	,314	,850
	[pos_eme_funds=3]	-,644	,170	14,380	1	,000	,525	,377	,733
	[pos_eme_funds=4]	0[b]	.	.	0	.	.	.	.

a. The reference category is: Informal.

10.6 Output from Multinomial Logistic Regression- Control regression with recoded age variable

Parameter Estimates

Transfer_chann_lst[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
Formal	Intercept	-,568	,146	15,050	1	,000			
	[education_rec=1]	-,734	,241	9,315	1	,002	,480	,299	,769
	[education_rec=2]	-,327	,134	5,937	1	,015	,721	,555	,938
	[education_rec=3]	0[b]	.	.	0	.	.	.	.
	[gender_rec=1]	-,147	,127	1,346	1	,246	,863	,673	1,107
	[gender_rec=2]	0[b]	.	.	0	.	.	.	.
	[age_three_g=1]	,793	,163	23,658	1	,000	2,211	1,606	3,044
	[age_three_g=2]	,458	,148	9,596	1	,002	1,580	1,183	2,111
	[age_three_g=3]	0[b]	.	.	0	.	.	.	.
Mixed	Intercept	-1,418	,182	60,585	1	,000			
	[education_rec=1]	-,722	,292	6,126	1	,013	,486	,274	,860
	[education_rec=2]	-,214	,151	1,996	1	,158	,808	,600	1,086
	[education_rec=3]	0[b]	.	.	0	.	.	.	.
	[gender_rec=1]	,031	,142	,046	1	,830	1,031	,780	1,362
	[gender_rec=2]	0[b]	.	.	0	.	.	.	.
	[age_three_g=1]	1,200	,194	38,078	1	,000	3,320	2,268	4,861
	[age_three_g=2]	,987	,178	30,894	1	,000	2,684	1,895	3,801
	[age_three_g=3]	0[b]	.	.	0	.	.	.	.

a. The reference category is: Informal.

b. This parameter is set to zero because it is redundant.