The Money is in the Mail: The evolution of the global Postal Money Order network

Florian Ploeckl
University of Adelaide
florian.ploeckl@adelaide.edu.au

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Sections on network structure as well as drivers of international organisation participation missing

Abstract

Starting in the second half of the 19th century national postal services expanded their domestic money order systems with the possibility to transfer money overseas. This was based on a network of bilateral arrangements between countries spanning around the globe. At the height of the First Globalization the system allowed the easy and cheap transfer of money internationally for wide swaths of the population. This paper explores the drivers of the expansion of the international network at the turn of the 20th century, in particular identifying the role of country characteristics, network effects, and the interaction with other global financial networks, including currency notations, capital flows, and multinational banking. The analysis uses a SIENA network simulation approach to address potential endogeneity within the network. Country characteristics relating to trade, financial investments, and administrative capacity played an important role; additionally network effects shaped the expansion while there were apparently almost no interaction with other financial networks. This is then compared to the factors shaping the countries' participation in one multilateral institutional framework for this expansion, namely the membership in the Universal Postal Union and its special agreements on postal money orders.

1 Introduction

The First Globalization was characterised by increasing flows of money, goods, and people around the globe. Financial integration between states and colonies around the world expanded not only in the volume of financial flows but also in the types of financial linkage; from the global spread of multinational bank branches, the integration of international capital markets and direct investment into overseas territories, to the increased notation of national currencies in financial centres around the world. These 'high-finance' connections linked mainly commercial interests and overshadowed the emergence of the international postal money order system, a "low-finance" global network that was accessible to and utilised by wide swaths of common people in countries around the world (Magee & Thompson, 2010; Esteves & Khoudour-Castéras, 2009).

This paper investigates how the network of postal money order links between countries spread around the world at the height of the First Globalization to form a globe-spanning network. This international system emerged within the imperial institutions of the British Empire as well as the Universal Postal Union, the forerunner of international organisations established by Western industrialised nations in the 1870s. Despite the involvement of these multinational institutions the network was built through bilateral arrangements, making every tie a decision by the two involved states only.

These bilateral links span a binary undirected network between countries which evolved and expanded throughout the next few decades, the hight of the First Globalization until World War I. Flandreau & Jobst (2005) take a similar network view to analyse the structure of international currency notations during the same period. Their attention to a core-periphery system, however, focuses on repeated cross-sections, so a static analysis at given points in time. Here, the attention is on the dynamics of the network, so the formation and dissolution of ties between countries over the two decades from 1890 to 1910.

Three different sets of factors underlying countries' decisions to establish or dissolve bilateral links are explored: country characteristics, network

effects, and interactions with other financial networks. These factors cover motivations for the use, such as gravity factors explaining international trade, the institutional and political capacity to participate in the system, the influence of the shape of the existing network, and the relevance of other financial linkages.

Methodologically, the dynamics of the network are explored using a stochastic actor-oriented model approach. The SIENA network simulation approach is designed to analyse which factors explain best the dynamic changes to a network, including direct network characteristics, individual and pairwise actor characteristics, as well as interactions with other networks. The method simulates the continuous evolution of the network and identifies which factors lead to patterns of tie changes that fits closest to the observed real-world network dynamics.

The baseline results show the presence of network effects, in particular an assortativity effect of countries with more existing links seeking each other out, while a range of economic and institutional country characteristics mattered as well. There is no indication of an effect from other financial networks in these results. When the evolution of the other financial networks is simulated at the same time, the network effect and country characteristics results remain mostly the same, though there is now a negative effect from currency notations onto postal money orders, though it is offset by a positive effect from money orders to currency notations. Given the high magnitude of these two effects, however, further exploration is necessary to confirm the validity.

2 Postal Money Orders

2.1 Historical Background

National public postal services emerged with the rise of nation-states in the first half of the 19th century. For a number of reasons, including reducing postal robberies by lowering the amount of cash sent in the mail, many of these services began to offer various financial services such as money orders. The increased international cooperation between postal services also led to

the possibility of sending money orders via the postal system to recipients in other countries. For example, the Royal Mail in the UK started money order services to Istanbul and British colonies in the Mediterranean as part of its postal services to support Crimean war efforts. The services to Gibraltar and Malta were maintained after the war with further services established first to other colonies (such as Canada in 1859) and then to other countries starting with Switzerland in 1868. Bilateral money order service links also began to emerge between other countries and territories in the decades following the 1850s.

The system of international postal money orders was one result of the emerging international postal cooperation that had culminated in the creation of the Universal Postal Union (UPU) in 1875. It is commonly seen as one of the first, if not the first, international institutions. The UPU not only had sovereign countries as members, which were represented by their respective national postal services, but it also accepted colonies as members in a two tier system with some, such as India, as full members and others as Danish possessions in the Carribean as a group under the supervision of the metropol country. A series of regular postal congresses created standardized rules for international mail exchange between member states, though states still had flexibility for special arrangements in a range of practical matters. The 1878 Postal Congress took such an approach to international postal money orders. A number of UPU members, though not all, signed a separate convention outlining a standardized approach to money orders. Signing onto the convention did not guarantee or oblige members to offer services to other convention members, nor did it prevent members from offering services with third countries. Most notably, the UK and its colonies did not join but maintained the established links within the Empire as well as bilateral links with other countries.

Practical Arrangements

Postal money orders were normally sold in specifically designated post offices. The purchaser had to specify a particular amount to be paid to the receiver,

the identity and address of that receiver, as well as the normally the place or office of payment. The money order form was then sent to the recipient while a separate advice form was sent to the receiving post service to notify and facilitate the payment to the recipient.

States were free to set practical details for the administrative arrangements including fees and maximum amounts in their bilateral arrangements, though the UPU special agreement did provide a set of rules for participating member states. These included maximum amounts (500 Gold Francs until 1897, then 1000 Gold Francs), time to expiry (2 to 6 months depending on geographic factors), and fees (1% or less of sent amount regardless of distance).

Money orders were denoted in the currency of the receiver. This implies that every postal administration had to set the exchange rate it used to convert the requested payment amount to the recipient into its own currency and the amount charged to the sender. The prevalence of fixed exchange rates between two countries, especially based on the Gold standard, consequently substantially simplified this process.

The imbalance between the value of postal money orders sent between two countries implies that a periodic settling of accounts and related financial transfer was necessary, which was normally done annually. Although some pairs of states did so bilaterally, a number of countries also did so through the UPU. Its permanent office already provided a settlement service, that facilitated a multilateral accounting which reduced the number of financial transfers between participating countries substantially. This service was extended to money orders as well (Semmelroth, 1910).

Usage

The usage of international money orders was predominantly by private consumers, though commercial enterprises were not precluded from doing so. Usage patterns varied widely between different country pairs and even by direction within pairs. Personal remittance payments were a major use case, especially for monetary transfers from North America to Southern and East-

ern Europe where flows almost exclusively went in one direction. Cushing (1892) reports that in 1891 just over $1.2mio were sent from the US to Italy, while only about $63k were sent in the other direction. Magee & Thompson (2010) show that transfers between the UK and Australia are driven by a range of factors, from remittances to personal savings to payments for commercial transactions.

Another anecdote highlighting the personal nature of money order transfers is provided by the Southern Times newspaper of Bunbury, Western Australia. In October 1897 it published a note that it had been informed by the local postmaster that in the twelfth months leading up to August 31st a total of £8964 15s had been transferred overseas, of which £838 14s, so just below 10%, were for commercial purposes and the rest[1] was for "maintenance", so private support remittance transfers.

Data

This paper tracks the evaluation of the network from 1890 to 1910 identifying active postal money order flows between 32 countries for the years 1890, 1900, and 1910. This includes territories in Europe, Asia, the Americas, and Oceania and is based on official UPU statistics and complemented by information from individual national postal services. Active flows are converted into binary links spanning a network between the included countries. Figure 1 shows the expansion and evolution of the network over the time period.

The data set includes a number of explanatory country characteristics. Summary Statistics are provided in table 1. These included GDP and distance between countries - the standard gravity factors reflecting the potential importance of a trade relationship between two potential partners - as well as total population. Additionally, financial factors such as the adoption of the gold standard and the short-term interest rates by potential partners. Social and political factors are covered by the inclusion of variables for socio-economic stratification, a democracy score, and an index of a country's In-

[1]Though these were the only two categories the postmaster asked his customers about.

formation Capacity. Institutional factors, such as membership in the UPU Special Agreement on Money Orders and membership in the British Empire, are also included. A Europe dummy is included as well.

Additionally, data on three more global financial networks are included. This includes the global network of foreign currency notations (so a network indicating which country's currency is traded in which other country)(Flandreau & Jobst, 2005), the capital investment flows from the UK, France, and Germany (Esteves, 2012), and the international branch networks of multi-national banks (Battilossi, 2006). While the currency notation network is clearly structured as a regular network of binary ties, one if a country's currency is notated in another and zero if it is not, the other two are specified in the form of bivariate networks. In contrast to regular nteworks, a bivariate network only contains ties between two actors from two distinct[2] sets. For example for the case of the capital flow network one set contains the three major financial markets, namely UK, France, and Germany, and the other set contains all included countries as potential investment destinations. A network tie then links a country with a financial market.

Empirical Strategy

2.2 Network Simulation Methodology

The empirical strategy is to use SIENA[3], a Stochastic Actor Oriented Network approach, to analyse the evolution of the network to illuminating what role country characteristics, network effects, and interaction effects with other financial networks played in the dynamics of establishing, and potentially dissolving, postal money order arrangements between countries.

SIENA has been designed to address situations of endogeneity involving network structures between actors. The basic principle is to simulate the evolution of a network, or potentially multiple networks simultaneously, over

[2]While the two sets can overlap, the importance is that they are conceptually differentiated.

[3]See (**?**) for background about SIENA; the following description in this section is based on Esteves et al (2024)

time and use this to conduct a statistical analysis based on repeated observations of the networks according to the Stochastic Actor-oriented Model.[4] Practically, the model is estimated with a routine written for R, RSiena, which uses a method-of-moments estimation procedure operationalized through repeated computer simulation (Ripley et al., 2024).

The starting point is the incorporation of a set of explanatory mechanisms based on country characteristics, network effects, and interactions with other financial networks, into the formation and development of postal money order network structures to identify their respective effects onto the formation and dissolution of ties, so the possibility to send money orders, between countries. To address potential endogeneity problems between networks the approach shifts the conceptual model from treating the observations over time as a series of discrete choices to a continuous process whose state is observed at specific time points. The network is therefore taken as evolving continuously over each time period. When multiple networks are included, their simultaneous modelling allows to account for mutual dependencies and multiple changes between the observed discrete points in time. The approach can also accommodate different network types, in particular directed ones, so a tie from A to B does not imply there is a tie from B to A, and undirected ones, where a tie between A and B always implies ties in both directions. Besides regular networks the estimation can also work for bivariate networks.

Structurally, the formal modelling of the explanatory mechanisms includes actor, dyadic, and network structure effects. Actor effects are based on particular country covariates, e.g. GDP, and look therefore like regular explanatory variables in a standard regression set-up. Dyadic effects are based on country-pair covariates, either direct tie variables such as the distance between the two countries or a combination of two country covariates[5] such as the difference between the interest rates of the two countries. Interactions with other financial networks are effectively modelled as such dyadic effect mechanism, for example the existence of a currency notation tie between two

[4]For greater details see the underlying works of **?** and **?**.

[5]A combination can distinguish between the roles of the two countries, for example origin and destination, and its values can consequently differ for the two countries.

countries. Finally, network structure covariates are based on the state of the network at the time, including the position of the actor country within it. An example is the network degree of a country, which counts a country's existing network ties with other countries. These mechanisms can either be static, so do not change their value over time, or time-varying. In the latter case covariates can vary based on time periods while network effects or mechanisms combining covariates and network effects can vary with any change in the network by any actor.

Changes in the network are modelled as the outcome of a two-step process comprising two sub-processes. The first process specifies when an actor has the possibility to make a change to the network, while the second determines whether and if so which actual change happens once that opportunity arises. The first is governed by a rate function while the second is determined by an objective function. The rate function is effectively a hazard rate function determining the timing when the next opportunity to change the network arises for a particular country. If multiple networks are simulated simultaneously, each has its own independent rate function such that the opportunity to change both networks will not happen at the same time. Formally, the rate function is modelled by an exponential process with the following density function:

$$g_i(t) = \lambda e^{-\lambda t}, t > 0 \tag{1}$$

where λ is a period-specific parameter for the rate function. If two networks are included simultaneously, then $\lambda = \sum_i (\lambda_i^Z + \lambda_i^X)$ with λ_i^Z and λ_i^X as parameters for the two network rate functions, respectively. This formulation implies that the probability that the next possible change actor i can make is λ_i^Z/λ for the first network and λ_i^X/λ for the other.

When a country gets the opportunity to make a change to its money order links, the objective function determines which change (if any) maximizes its utility. Starting from the current network structure, the actor country has three possible actions with respect to each other country in the network: initiate a new tie (if one already exists), dissolve a tie (if there is none),

or retain the existing network without making any change. If there are n actors this then implies n possible actions consisting of changes in $(n-1)$ ties to other actors plus the retention of the existing structure. Formally, the network objective function, which includes the mechanisms representing the network structure, actor and dyadic covariates, is given by:

$$f_i^X(\beta, \mathbf{x}) = \sum_{\mathbf{k=1}}^{\mathbf{m_1}} \beta_k^X \mathbf{s}_{ik}^X(\mathbf{x}) \tag{2}$$

Following generalized linear statistical models, this function is a linear combination of a set of *effects*, $s_{ik}^X(\mathbf{x})$, which are functions defined on the state of the network, taking the included country covariates as given. Statistical parameters β_k represent the importance of the respective effects so $f_i^X(\beta, \mathbf{x})$ is the value of the objective function for actor i depending on the state $\mathbf{x}$ of the network.

Similarly to a multinomial logistic regression, this allows to calculate the probability of any single tie change shifting the network status from $\mathbf{x}$ to $\mathbf{x}'$. Given the parameters of the objective functions this probability is:[6]

$$P(x) = \frac{exp(f_i^X(\beta, \mathbf{x}')}{\sum_{x' \in C} exp(f_i^X(\beta, \mathbf{x}')} \tag{3}$$

These functions are used in the simulation algorithm to execute the estimation. The procedure samples parameter values with the goal of maximizing the probability of matching the characteristics of the actual observed network at the end of each period. The utilized Methods-of-Moments estimation results in estimates of parameters such that the moments of the simulated networks matches those of the observed networks (Ripley et al., 2024). Next to an estimate for each parameter the algorithm also provides a standard error as well as a t-statistic of the convergence for each parameter.[7]

As usual, the signs of the estimated parameters and their standard errors

[6] C is the set of all $n-1$ possible tie changes. This probability is defined for a directed network with a behavioural variable so tie x_{ij} can take the value 1 while x_{ji} is 0 (and vice versa).

[7] The latter provides a check whether the simulated values converged sufficiently close to the observed network values.

indicate the direction of the effect (so the formation of a tie is more or less likely) of the associated mechanism as well as its statistical significance. The estimated parameters for each effect should be interpreted as a form of log-odds ratios. The explanatory covariate variables are normally centred on their mean, so if they are held at this rate, the parameter estimates give the effect of an one-unit change in size of each mechanism on the probability of an increase (or decrease) in the network.

The scope of that change depends on the nature of the respective mechanism and involved covariates. Practically this falls into two categories: Actor-specific (ego) mechanisms and Target-specific (alter) mechanisms. An ego mechanism is a specific characteristic of the country that has the opportunity to make a change, so for example the number of existing ties it has or its GDP value. In such a case the implied change in probability applies uniformly to all possible tie changes, so in the case of a positive parameter the probability of forming a new tie is increased for all partner countries where there is no tie yet and the probability of dissolving an existing tie is decreased. An alter mechanism is a specific characteristic of the potential partner country, so the destination of the tie. Adherence to the gold standard or the size of the GDP of the partner country are such effects. In such a case the implied change in probability now varies with the value of the mechanism for the potential partner.

Another aspect is the symmetry of the effect depending on the existence of tie. If an increase in the value of a mechanism increases the probability of a tie to be formed, it decreases the probability that a tie is dissolved in case it already exists.

The method is not designed to ensure or identify causal effects. The main attention is to explore the nature and structure of the influence in both directions between two (or more) potentially endogenous networks[8]. However, under a number of conditions the derived relationship between the networks can be interpreted causally. These conditions include the dynamics of the networks reflecting a Markov process in continuous time, the independence of

[8]The method can also accommodate an numerical, ordinal actor characteristics as the second outcome.

actions by the actors (so no multilateral or simultaneous actions), the conditional independence between actions in the two networks (so changes to one network cannot imply simultaneous changes to other networks by the same actor), and finally the restriction that only one tie can be changed at a given time. Overall, the bilateral nature of the postal money order network and the characteristics of the other networks do fit these conditions reasonably well. In addition to the relationship between the outcome networks, the similarity in interpretation of the coefficients for the other included explanatory to those derived from a regular discrete choice specification also applies to the assumption of causality of these included exogenous explanatory factors.

Baseline specification

The evolution of the undirected postal money order network is analysed for 32 countries. The estimation uses three waves of observations, namely 1890, 1900, and 1910, to look at the changes over the two decade-long periods.

The estimation includes the following mechanisms to explore the relevance of these factors for the evolution of the money order network:

A basic network effect included in all specifications is the *Degree* mechanism, which takes on the value of the number of ties a country has. A positive parameter implies that countries accelerate the formation process, while a negative parameter implies that countries slow down the speed of creating new money order links with other countries.

Other included network effects are *transitive triads*, *4-cycles*, and *degree assortativity*. The transitive triad mechanism explores whether countries are more likely to close triads, so do form links with countries that already have a link with a third country with which the actor country also has a link. The 4-cycles mechanism is an imitation effect, so if the actor country A and another country B have both links to a common country C, does A then imitate B and form links with another country D with which B also has already a tie. Finally, the degree assortativity mechanism, which is determined by the square root of the product of the number of ties by the actor and the potential partner country, provides an indication if countries with more ties

seek out other countries with more ties.

Included country covariate mechanisms focus predominantly on the characteristics of the potential partner country[9]. The inclusion of *GDP* and the *distance* between the two countries follows the standard gravity approach to trade. This is complemented by the inclusion of the population of the country. A mechanism indicating in dummy form whether the pair of countries includes a European and a non-European country is a rough proxy for the relevance of European migration to the rest of the world. Financial motives are included through the *short-term interest rate*, specified as the partner country rate and the absolute difference between the rates of the two countries. Furthermore, the potential partners adherence to the *Gold standard* is a financial but also an institutional characteristics, as gold standard based fixed exchange rates provided direct operational benefits for postal services in managing the necessary exchange rates for money orders. Further institutional characteristics with direct relevance for the arrangements of postal money orders are whether a potential partner country is part of the *British Empire* and whether that country had signed onto the *UPU Special Agreement* on postal money orders. Other country characteristics with potential relevance for the capability and desirability of a country as a potential money order partner are *Information capacity*, a measure of a country's capability to deal with information-heavy administrative organisation, *Political Score*, a measure of a country's level of democracy, and *SES*, a measure of a country's socioeconomic distributional makeup.

Finally, the interaction with other financial networks is included. At first the state of these networks are taken as exogenous, though in a further extension the effect from the postal money order network onto these networks is included as well. The first is the *Currency Notation* network, so does the notation of a country's currency in another country influence the establishment of a postal money order connection. The *Capital Flows* bivariate network indicates whether countries that receive capital investment from the same European financial market were more likely to form a link. And finally, the *Multi-national Banking* network indicates whether the presence of multi-

[9]This is signified by the term "alter" in the results tables.

national banks from the same origin country in a pair of countries made those two countries more likely to form a money order link.

Financial Network Interdependence

The main specification takes the effect from other financial networks onto the postal money order network as exogenous. This, however, does neglect the potential reverse causality effect from the postal money order network on the other financial network.

To accommodate the other direction of the interaction between postal money orders and currency notations, capital flows, and multi-national banking, these three networks are simulated simultaneously with the postal money order network.

The specification of the postal money order network and its included mechanisms remains identical to the main specification, while for simplicity the three other financial networks only include the pairwise interaction with the respective other three networks as mechanisms besides the basic degree effects.

Results

Tables 2 to 4 show the results for the main specification, while table 5 presents the results using the simultaneous co-evolution of the other financial networks in the analysis.

Overall, the baseline results indicate the relevance of network effects as well as country characteristics, but no apparent influence from other financial networks.

In terms of network effects, the Degree effect indicates that a higher number of existing money order arrangements with other countries reduces the likelihood to add another one. The magnitude becomes much larger with the inclusion of the other network effects[10], but even in their absence the indi-

[10]This is likely the result of the degree assortativity effect, which has a large offsetting effect.

cation is that countries did not race to complete links with every available partner, but slowed down over the course of their expansionary activities. The absence of triad and four-cycle effects point to a bilateral nature of personal usage of money orders, where essentially only the direct possibility to access a specific country mattered. There is a positive effect of Degree assortativity, which is consistent with certain postal administrations becoming active beyond country characteristics and pushing to conclude agreements with other active administrations.

In terms of particular characteristics of potential destination countries the effects fit mostly with the expectations. There is a strong correlation with trade relationships, a higher GDP and a lower distance increased the likelihood to create a money order arrangements. Although GDP is marginally out of statistically significance once network effects are included, the magnitude of the effect is such that a one unit increase raises the probability by 2%, while the same increase for the (log) distance decreases it by 60%

Financial characteristics also mattered, the financial opportunities of a higher interest rate increased the likelihood of selecting a particular country, with 1% higher rate increasing it by 42%. The positive effect of the gold standard is similarly consistent and quite substantial, being on gold raises the probability by 128%, though it likely also reflects the direct operational benefit for the exchange rate and balancing of accounts.

Although the coefficient for Europe/Non-europe pairs is consistently positive, it is not significant. In contrast, there seems to be a barrier between British Empire countries and others with a 52% lower likelihood. Although substantially positive, implying a 48% higher likelihood, the coefficient of membership in the UPU special agreement is not significant. The difference in significance for the specifications with and without network effects indicate that further exploration of the separation in network and covariate effects is warranted.

Another aspect is state capacity, more democratic countries (33%) and those with a higher information administrative capacity (45%) were more likely targets as well. Postal administrations were normally public monopolies, hence the higher information capacity indicates that the level of ad-

ministrative capability likely an influence of the integration into the global postal money order network.

Finally, in this specification there is no indication that there was an influence from other financial networks towards the postal mail order network.

Based on the more in-depth exploration of the relevance of other financial network table 5 presents the results when the evolution of the mail order network is simulated simultaneously with that of the currency notation network, capital flow network, and multinational bank branch.

The results for network effects and country-specific characteristics are pretty much in line with those from the baseline specification, though small changes in magnitudes are detectable. One notable change is that the effect of the British Empire is smaller and not significant, so including the financial network development appears to mediate the inclusion of the network effects for this effect.

In terms of interactions with other financial networks, there is again no indication of a relationship with the capital flows and the multinational banking branch network. However, taking into account the reciprocal relationship between the two networks shows that the money order network is complementary to the currency notation network, as a currency notation reduces the likelihood of a postal money order arrangement. That effect, however, is counterbalanced by the effect of the postal money order network on the currency notation network, as a money order arrangement increases the likelihood of the currency getting notated on the local stock exchange. Given the very sizable magnitude of the effects (a 72% reduction in likelihood if a currency notation is present), further exploration into this pattern is needed to form a clear conclusion.

Conclusions

The existence of the global postal money order network during the height of the First Globalization has not received a lot of attention in contrast to other global financial links. Here a network approach is taken to explore whether there were was a notable relationship between the very broad

consumer-oriented postal money order network and more "high-finance" oriented networks.

Results largely indicate that the postal money order network evolved separately from other financial networks during the height of the First Globalization. Financial motives, however, were not completely absent from the evolution as short-term interest rates and especially the Gold Standard played a substantial role in shaping the dynamics of the network.

In addition, other economic motives, especially trade oriented, played a role as did political and social factors which were associated with a higher level of state capacity and administrative capabilities. Additionally, network effects appear to have been present, though these apparently interacted with other institutional groupings of countries.

The study demonstrates that the evolution of an important institutional network underpinning the First Globalisation reflected a mix of relevant factors, from individual country characteristics to network effects, highlighting the relevance of institutional aspects and their interactions with other economic and social characteristics for the development of international institutional linkages.

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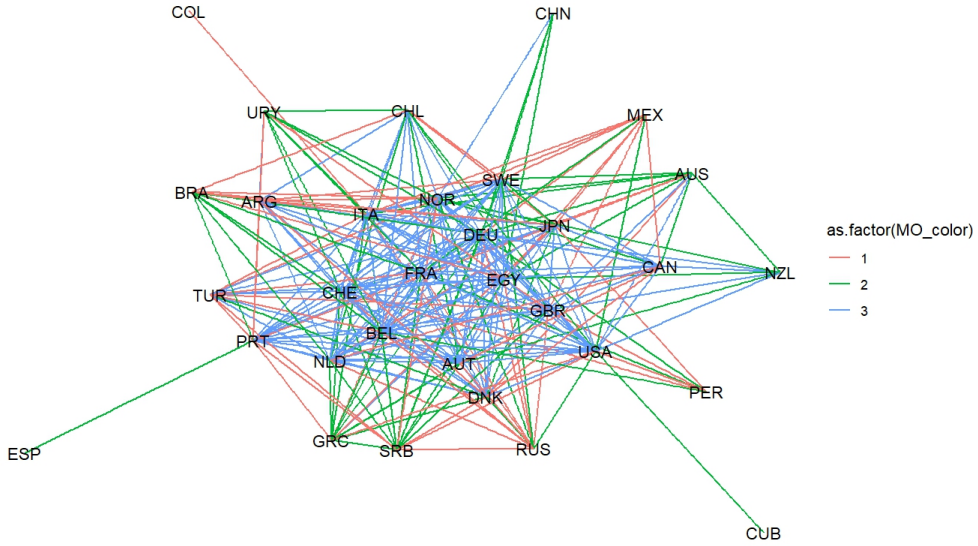
Figures

Figure 1: Money Order Network



The figure depicts the evolving Money Order network links from 1890 (blue) to 1900 (new in green) to 1910 (new in red)

Tables

Table 1: Summary Statistics

	mean	sd	median	min	max
Population	3.199	7.470	0.558	0.071	42.562
GDP	8.612	13.784	2.236	0.275	66.977
Distance	8.522	1.059	9.011	5.373	9.886
Interest rate	6.237	2.098	6.000	2.790	11.400
Gold Standard	0.641	0.480	1.000	0.000	1.000
Europe	0.469	0.499	0.000	0.000	1.000
British Empire	0.125	0.331	0.000	0.000	1.000
UPU-Special Agreement	0.531	0.499	1.000	0.000	1.000
SES score	-0.807	1.358	-0.330	-2.889	1.126
Info Capacity	4.721	1.347	4.610	0.000	6.050
Political Score	3.000	1.720	2.955	0.080	7.900

Summary Statistics for pooled observations in 1890 and 1900.

Distance values based on matrix between included countries

Table 2: Money Order network baseline analysis - Country Characteristics

Effect	par.	(s.e.)
Rate 1	3.440	(0.454)
Rate 2	2.787	(0.355)
degree (density)	–0.441	(0.513)
GDP alter	0.051***	(0.014)
Pop alter	0.032	(0.034)
Distance	–1.098***	(0.192)
Gold alter	1.441***	(0.429)
RShort alter	0.225*	(0.102)
RShort abs. difference	–0.022	(0.068)
Europe abs. difference	0.260	(0.268)
BritEmpire abs. difference	–0.511	(0.419)
UPU-SpAg alter	1.306**	(0.443)
SES alter	–0.119	(0.142)
InfoCap alter	0.718***	(0.192)
PolScore alter	0.294*	(0.138)

† $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$;
individual parameter convergence t ratios all < 0.04.
Overall maximum convergence ratio 0.05.

Table 3: Money Order network baseline analysis - Country Characteristics and Financial Networks

Effect	par.	(s.e.)
Rate 1	3.456	(0.459)
Rate 2	2.783	(0.352)
degree (density)	–0.664	(0.589)
GDP alter	0.048**	(0.015)
Pop alter	0.025	(0.035)
Distance	–1.098***	(0.201)
Gold alter	1.493***	(0.440)
RShort alter	0.215*	(0.103)
RShort abs. difference	–0.013	(0.075)
Europe abs. difference	0.329	(0.265)
BritEmpire abs. difference	–0.452	(0.472)
UPU-SpAg alter	1.352**	(0.494)
SES alter	–0.124	(0.152)
InfoCap alter	0.681***	(0.204)
PolScore alter	0.272†	(0.144)
	.	.
Currency	–0.318	(0.493)
CapFlows	0.162	(0.186)
Banking	0.167	(0.168)

† $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$;
Individual parameter convergence t ratios all < 0.02.
Overall maximum convergence ratio 0.06.

Table 4: Money Order network baseline analysis - All Characteristics

Effect	par.	(s.e.)
Rate 1	5.429	(0.970)
Rate 2	2.838	(0.360)
degree (density)	–4.421***	(1.149)
transitive triads	–0.191	(0.160)
4-cycles (1)	0.010	(0.011)
degree(sqrt) assortativity	0.239*	(0.109)
	.	.
Distance	–0.914***	(0.196)
GDP alter	0.022	(0.015)
Pop alter	0.039	(0.033)
Gold alter	0.823*	(0.393)
RShort alter	0.357**	(0.117)
RShort abs. difference	0.001	(0.073)
Europe abs. difference	0.237	(0.254)
BritEmpire abs. difference	–0.724†	(0.405)
UPU-SpAg alter	0.394	(0.455)
SES alter	–0.163	(0.149)
InfoCap alter	0.373*	(0.175)
PolScore alter	0.290*	(0.140)
	.	.
Currency	0.420	(0.520)
CapFlows	0.100	(0.142)
Banking	–0.060	(0.162)

† $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$;
Individual parameter convergence t ratios all < 0.04.
Overall maximum convergence ratio 0.08.

Table 5: Financial Networks Interaction analysis

MoneyOrder Network	Coef.	(s.e.)
MoneyOrder: degree (density)	–4.305***	(1.122)
MoneyOrder: transitive triads	–0.148	(0.163)
MoneyOrder: 4-cycles (1)	0.009	(0.012)
MoneyOrder: degree(sqrt) assortativity	0.205*	(0.093)
MoneyOrder: Distance	–1.007***	(0.192)
MoneyOrder: GDP alter	0.027†	(0.014)
MoneyOrder: Pop alter	0.037	(0.036)
MoneyOrder: Gold alter	0.901*	(0.444)
MoneyOrder: RShort alter	0.328**	(0.118)
MoneyOrder: RShort abs. difference	0.017	(0.073)
MoneyOrder: Europe abs. difference	0.200	(0.252)
MoneyOrder: BritEmpire abs. difference	–0.491	(0.451)
MoneyOrder: UPU-SpAg alter	0.552	(0.488)
MoneyOrder: SES alter	–0.148	(0.158)
MoneyOrder: InfoCap alter	0.410*	(0.173)
MoneyOrder: PolScore alter	0.258†	(0.145)
MoneyOrder: mutuality with Currency	–1.259†	(0.734)
MoneyOrder: from CapFlows agreement	0.305	(0.429)
MoneyOrder: from Banking agreement	0.009	(0.166)
	.	.
Currency Notation Network	.	.
Currency: outdegree (density)	–3.607†	(1.916)
Currency: reciprocity	1.685*	(0.732)
Currency: MoneyOrder	2.234*	(0.939)
Currency: from CapFlows agreement	1.813	(1.593)
Currency: from Banking agreement	0.116	(0.281)
	.	.
Capital Flow Network	.	.
CapFlows: outdegree (density)	–3.729***	(1.123)
CapFlows: indegree - popularity	0.076*	(0.037)
CapFlows: MoneyOrder to agreement	–0.046	(0.050)
CapFlows: Currency to agreement	0.702**	(0.227)
CapFlows: Banking	0.858†	(0.449)
	.	.
Bank Branch Network	.	.
Banking: outdegree (density)	11.118	(39.046)
Banking: indegree - popularity	–0.424	(1.530)
Banking: MoneyOrder to agreement	–0.502	(1.854)
Banking: Currency to agreement	–0.124	(1.663)
Banking: CapFlows	3.902	(18.943)

† $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$;

Individual parameter convergence t ratios all < 0.03.

Overall maximum convergence ratio 0.15.

Appendix

Included Countries

The following countries are included in the data sample:

Argentina, Australia, Austria, Belgium, Brazil, Canada, Switzerland, Chile, China, Columbia, Cuba, Germany, Denmark, Egypt, Spain, France, UK, Greece, Italy, Japan, Mexico, Netherlands, Norway, New Zealand, Peru, Portugal, Russia, Serbia, Sweden, Turkey, Uruguay, USA