

Online Money Flows: Exploring the Nature of the Relation of Technology's New Creature to Money Supply

—A Suggested Conceptual Framework and Research Propositions

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Abstract

Framing the analysis of Technology influences in an extended scenario of macroeconomic topics of the kind of Money Supply, attention is given to changes in economic paradigms that technology is constantly creating globally, focusing the research interest in the nature of the relation between cross border E-Commerce online money flows and Money Supply. As this context requires to find an explanation that cannot be provided by pre-existing theory, the abduction or abductive approach is considered to be suitable to investigate how far available data on the matter fits with the stated research subject identified at a crossroad of Technology Theory, Business Theories and Monetary Theory. The findings disclose that the nature of this relation is rooted in the Directionality, Dynamism, Intensity and Structural Properties, connected in a relational net that favors the configuration of a Theoretical body of knowledge. From the propositions' relational models shape, a key finding come into sight as is supported the notion that cross border E-Commerce online money transfer, is a process by which cash money in circulation (Money Aggregate M1) is transformed into highly liquid assets other than cash, referred to as Quasi-Money, leading to dynamic changes for Money Supply net value and in the velocity of money. This view is consistent with the appreciation that being online money flows one new additional component of M2, they are absorbed by Money Supply being for that reason a priority issue for monetary policy interest. The emergent relational net, outlines a theory in which recognizing online money flows as a technology derived component—a technology creature—Technology influences reach the Economy at macro level by means of its effects over Money Supply M2 Aggregate. The research process is completed with a Case developed to explore how the suggested

conceptual framework works, as well as to exemplify how the set of propositions formulated are actionable by observable indicators.

Keywords

Technology and Money Flows, E-Commerce Online Money Flows, Abduction Method, Online Money Flows and Money Supply (M2), Complex Systems Interaction

1. Introduction

Information Technology (IT) development is recognized as a major technological breakthrough that has had a transformative impact over business practices, business processes efficiency, human and society communication modes as well as major changes in economic structures. IT impact has been widely analyzed from diverse perspectives such as competitiveness and operational efficiency as supported by early works of Brynjolfsson & Hitt [1] as well as by reports of a prestigious consultant such as McKinsey [2], top management sphere of decisions regarding technology, the effects over persons' attitudes and behavior as drivers of change as is generally accepted since Davis' development of the Technology Adoption Model [3], as well as regarding awareness of the need to incorporate technological issues within strategic decision making issues of the kind of new business models' development and operation. Global IT infrastructure platform enables firms to operate interactions among business partners resulting in collaborative and synchronized processes transactions such as the ones involving money flows between and among business partners and customers, as well as those operations related to tax administration compliance, being adopted in a growing number of countries as is reported in a recent OECD publication [4].

Business interactions and transactions conducted through Internet as an open network and other comparable systems are referred to by organizations [5], as well as by consultant firms [6], and International Organizations [7], as Digital Economy, Information Economy [8], Virtual Economy, the Web Economy or The New Economy. As Information Technology impact strikes most of economic activities, changes emerge surprisingly creating new business technology-based paradigms as well as economic components, among which online/electronic money flows emerge as a new technology creature of key importance due to its cross border field of action in Global Electronic Commerce transactions, velocity of money movement among countries, and multi-currency operation possibilities, all of them framed by macroeconomic components referring to the measurement of the total amount of monetary assets available in a particular economy at a particular point of time, known as Money Supply or Money Stock structure [9]. The concern about the relation of a monetary component of the Digital Economy termed electronic money/EMoney was introduced by Helleiner

in a seminal article by since late 90s [10], providing basis to evolve into the emergent issue of monetary policy under the Information Economy context introduced by Woodford [11]. Following this ideas, the implications of Technology on Monetary Policy were introduced into the macroeconomic field discussion [12], reaching recently into the analysis of the impact on Monetary Policy of the use of Electronic Money [13], as a key advance of a theoretical field still in progress.

As Digital Economy does not distinguish itself by a rich heritage of theory development analysis on the matter usually search for explanation in theories borrowed from different scientific fields, as identified for issues of the kind of the relation between Money Supply and the amounts of electronic money—EMoney—moving in a stream/circulating by means of a technological infrastructure support, identified as an open network-online—such as Internet, referred to as *online money flows*. The explicit distinction of this concept is set by its dynamic-flow [14]—and its aggregate—amount/sum total or more quantities or sums/the full effect [15]—characteristics, underlying the difference as a unit of analysis from the specific character of surrogate for coins and banknotes of *EMoney* concept defined by the EC Directive as... monetary value as represented by a claim on the issuer which is stored on an electronic device, issued on recipient of funds of an amount no less in value than the monetary value issued, and accepted as means of payment by undertakings other than the issuer, an electronic store of monetary value on a technical devise that may be widely used for making payments... [16] [17].

Two main areas of knowledge in which online money flows concept interacts are identified in the IT arena, due to the technology infrastructure component that enables their movement from buyer to seller, as well as in the business field considering its operational nature in transactions completion and its revenue generator purpose. Both views are rooted at micro economic level. The macroeconomic level perspective emerges when is faced a wide array of *Digital Economy* definitions existing in-between dictionary sources and text books such as:

...a *Digital Economy* is an economy which functions primarily by means of digital technology, especially **transactions** made using internet [18],

...an economy that is based on digital technologies [19],

to results from academy' recent works focused on the matter containing the following declaration:

...we therefore define the digital economy as “that part of the economic output derived solely or primary from digital technologies with a **business model** based on digital goods and services” [20].

A deep view into the first and the second definitions suggest the existence in parallel of two economies differentiated by the setting-place/space—in which their activities are performed and the technology means by which the economic activities are operated, while the second definition consider it as a *part of the*

economic output. Differences among definitions jump at sight.

Comparison of these definitions, presented as a brief insight on the matter, express indirectly that Digital Economy as a theoretical construct seems to be in the initial development phase, being clear that to be operationalized or measured, diverse concrete representations or variables and their observable indicators and measures should be determined. Any connection to emergent specific economic components created, such as the online money flows, is observed in the definitions analyzed raising from this reasoning the interest to focus the attention in online money flows created by ECommerce transactions, as considered to be one concrete representation or variable with its specific measures and indicators.

To move forward in theory formulation, a necessary step is to benefit clarity over the diversity of views stated in the many and different construct' definition found in the literature review, by means of the identification of the role of online money flows either as a component of a new Economy structure or as a new component of the existing Economic structure. In this context, knowledge regarding the *nature* of online money flows and Money Supply relation emerges as a key issue to conduct theoretical research activities oriented to gain understanding regarding the characteristics of the relation between the Digital Economy monetary component derived from ECommerce transactions—online money flows—and the Economic Structure monetary component—Money Stock/ Supply—as the effects of ECommerce online money *flows* may be considered as possible triggers of changes in Money Stock/Supply structural composition, its size and/or in the velocity of money. This relation has been discussed under the approach of the impact of *electronic money* on monetary policy providing a wide range of views gauged from those declaring that there are no implications [21], to the ones declaring that the influence of EMoney on Monetary Policy—using indistinctly the term digital money [22]—can be seen through Money Supply Money Aggregates [23] [24]. For the research interest this view results of particular interest as relies in established regulations on the matter such as the one of the European Central Bank (ECB) concerning the balance sheet of the monetary financial institutions sector, registering EMoney on the liability side as part of the money aggregates, included in transferable deposits, in the category of overnight deposits or balances of immediate conversion into currency or to be used for cashless payments [25] and [26].

The possible influence of EMoney on the monetary policy has already been reviewed, identifying a reference in the results of a survey, with data from the 2002-2003 years period, applied to 95 central banks and financial institutions by the Bank for International Settlements declaring that even when major implications of EMoney for monetary policy were not expected—at the survey time—the participating central banks report that they were considering to monitor such development, or to include EMoney data in monetary statistics, being some of them implementing activities on the matter such as data collection [27]. Inter-

tingly, none of the referred surveyed institutions indicated adverse effects on them balance sheets of EMoney over Money Supply Aggregates such as money in circulation (M1), neither a specific policy response envisioned. This scenario seems to be fairly similar after more than a decade.

The wave of effects of the relation between online money flows and Money Supply extends to the imminent emergence of requirements for diverse register venues of the Import/Export transactions undertaken between one country and others, traditionally incorporated as a credit-debit in the Current Account register of the Foreign Trade Balance, as ECommerce business models foster operations in which online money flows move back and forth countries where online transactions are completed following a path diverging from the one configured by the countries where the correspondent traded goods are shipped and/or delivered. Such operations representing non parallel intangible movement of money flows and tangible movement of goods, seems to require traceability records for each own as necessary input to be registered in National Accounts System and in specific Census Indicators, for reliable hard data creation to build solid ECommerce activity measurement in terms of GNP contribution, its impact over international currency reserve, as well as for the definition of taxation (VAT) control criteria over online flows operations, among other macroeconomic issues at country level.

2. The Research Framework

2.1. Online Money Flows: A Construct of Interest

Works on the theoretical dimension starts with the identification of the constructs of interest as a basis to describe the relations among them and then determine the observable indicators required for the constructs measurement. The path to online money flows is traced since the E-Commerce and Digital Economy constructs measures and indicators. From literature review emerges evidence of the concern regarding Internet Economy measurement in a work published more than a decade ago by the Center for Research in Electronic Commerce of the University of Texas [28], that presents a Conceptual Framework developed to understand how the Internet economy works considering four layers, identified as 1) Internet Infrastructure (networking/connectivity); 2) Internet Applications (software, standardized messages, languages); 3) Intermediaries such as companies that link buyers and sellers (market spaces, content, etc.) and 4) a layer named Internet Commerce which stands for companies involved in direct commerce transactions to business and/or consumers. This proposed framework by determining Internet Commerce activities as one of the Internet Economy layers introduce the idea of different theoretical constructs, identifying Internet/Electronic Commerce as one observable indicator of the Internet/Digital Economy construct able to be expressed in terms of monetary units.

Being the first construct' differences acknowledged, literature review takes the search into the data sphere. At present, important efforts—applying different

methods—have been realized regarding macroeconomic approaches to measure the impact of Internet on Growth as the one identified in works released by The UNCTAD [29] and in the previous mentioned MacKinsey report [2], with estimations *sizing Internet Economy*—for GDP quantification purposes,—the first source covered 137 countries while the second source include results of a survey applied in 13 countries (representing 70% of world' GDP), being considered the first as the sum of Internet consumption in terms of ECommerce, Services and Access, public expenditure and private investment on the matter, and interrelated Trade Balance of goods and services. In regard of *ECommerce measurement*, key works developed by The ECommerce Foundation that also serves as ECommerce Europe's research institute provide reliable data from European and more than 15 other countries based on Global Online Measurement Standard for B2C ECommerce (GOMSEC), organized by Global, Regions and Country' amount of revenue classified on areas/sectors, as an indicator of ECommerce activities defined broadly by them as ...*Any B2C contract regarding the sale of goods and/or services, fully or partly concluded by a technique for distance communication...* [30]. Measures at national country level are found in sources such as the US Census Bureau, which provides national estimates of ECommerce activity in key sectors of the economy [31]. A mention is made to the methodology developed for such a purpose, as well as the one applied in the Annual Retail Trade Survey (ARTS) series [32]. The revision made reveals the existence of a crucial differentiation of two entities, the first refers to *Internet/Digital Economy measurement*, while the second refers to the *measurement of ECommerce transactions* identified as one component/layer of the Internet/Digital Economy, being feasible to manipulate data of the construct in terms of data aggregation as illustrated in data referring to ECommerce sales at *national* country level. From this order of ideas rise the notion in which ECommerce is a construct able to be measured by its amount/value in terms of diverse observable indicators such as amount value, sales value, cross border operations, packages, volume, etc.

Selecting ECommerce *value* as one of the variables considered to measure the Digital Economy construct, the value amount in monetary units of each ECommerce transaction (purchase/sale) completed in an open network by means of an electronic transfer (payment), creates online money flows representing an intangible monetary component in circulation in the figure of highly liquid assets in foreign and national currencies, that ends being absorbed by the engaged country's Money Stock, making then reasonable to consider that it receives an effect over its total amount, the velocity of money, or both. Upon this basis Online Money Flows became a construct with observable indicators in terms of value, under varying conditions determined by the cross-border characteristic, the question of interest emerging here refers to ...what is the nature of the relation involving the monetary components of both the Digital Economy—cross border ECommerce Online Money Flows—and the existing-Money Stock/Supply-Economic Structure? The notion of online money flows in this research

question refers to amounts of paperless monetary transactions—monetary value as defined by the European Central Bank—, being transferred by electronic means—instantaneous delivery—, and not to a new mode of issue of currency. Safety and security of these operations rest in several measures such as data encryption—coded data that once received are decoded by the recipient’s service or bank—and data transmission processed by an independent agency (Automated Clearing House). Examples of e-money transactions are online payments completed using Internet by means of debit card, smart card, credit card as well as electronic fund transfer from bank to bank enabled by technology infrastructure such as computers, tablets, mobile phones apps or ATMs. It must be noticed that in this context the term Electronic Transfer, is used as a general reference for the transfer of money funds using Internet as an operational enabler, regardless its online payment mode, payment scheme selected, or electronic device used for such a purpose.

As the search horizon on the matter of interest moves defining its boundaries to the mentioned research focus, an important finding supporting the research interest on the matter is that even when ECommerce turnover—money transferred via electronic means—shows an incremental growth estimated by Ecommerce Foundation 2015 in 17.5% in 2016 [33], there is no evidence of online money flows control by a specific macroeconomic policy until the publication by the European Commission in December 1, 2016, of a legislative proposal to regulate taxes from cross-border Ecommerce termed “VAT Package” in the context of the strategy to create a single Digital Market for the European Union (EU). The VAT Package proposal aims to provide business conditions in which “*instead of having to declare and pay VAT directly to each individual Member State where the customers are based, businesses are able to make a single declaration and payment in their own Member State*” [34]. Currently Ecommerce activities in the EU reap benefits from VAT exemption regulation on import goods from non-EU suppliers with a declared value below 10/22 Euros, operating since 1983. The European Commission argues as a powerful reason for the VAT modernization for Ecommerce activities in the EU, the annual loss estimated in at least 5 billion Euros in VAT revenues for Member States [35]. Advances related to a common payment scheme, are identified in The Single Euro Payments Area (SEPA), developed by the European Payments Council as a set of rules and technical standards that can be regarded as instruction manuals to move funds from one account to another within the SEPA schemes that operates with open access criteria (Article 28 of the Payment Services Directive/Directive 2007/64/EC of the European Parliament and of the Council of the EU of November 2007 on payment services in the internal market). The transference between banks of SEPA payment messages is operated by means of ISO 20022 XML message standards (UNIFI). Regarding this topic, ongoing works on the matter have reach the point of decisions among EU member states for strong security measures oriented to financial institutions’ protection from fraudulent transactions

risk. The context briefly described strongly supports the topic of interest declared for this research.

2.2. Money Stock/Supply a Construct of Interest

The relation between online money flows and Money Supply attracts attention when considering that as result of the Global span of operations, cross-border ECommerce transactions give rise to online money flows moving from one country to another with an expected impact at macro level on Money Stock (velocity and size of Money Stock available), domestic currency reserve (expenses/ payments in foreign currencies), internal demand (international purchases) and/or Trade Balance (imports-exports). A key tool of macroeconomic policy, the concept of Money Stock/Supply—the total amount of money/monetary assets available in an economy at a particular point in time,—is configured by a set of measures or Money Aggregates (M0, M1, M2, etc...), frequently classified under each countries criterion, reflecting diverse levels of liquidity. In its general acceptance, M1 is the term designating liquid forms of money, currency in hands of the public, demand deposits, travel checks and other deposits against which checks can be written [36]. Money Aggregate indicated to as M2, is configured by M1 as well as by a component known as Quasi-Money or Near Money representing highly liquid assets other than cash, not suitable as exchange mediums, that can be quickly changed into cash or checking deposits [37]. Being Money Supply the key construct setting the foundations of the research focus, to benefit clarity and construct validity its configuration is described in **Figure 1**, introducing as well the M2 definition break down.

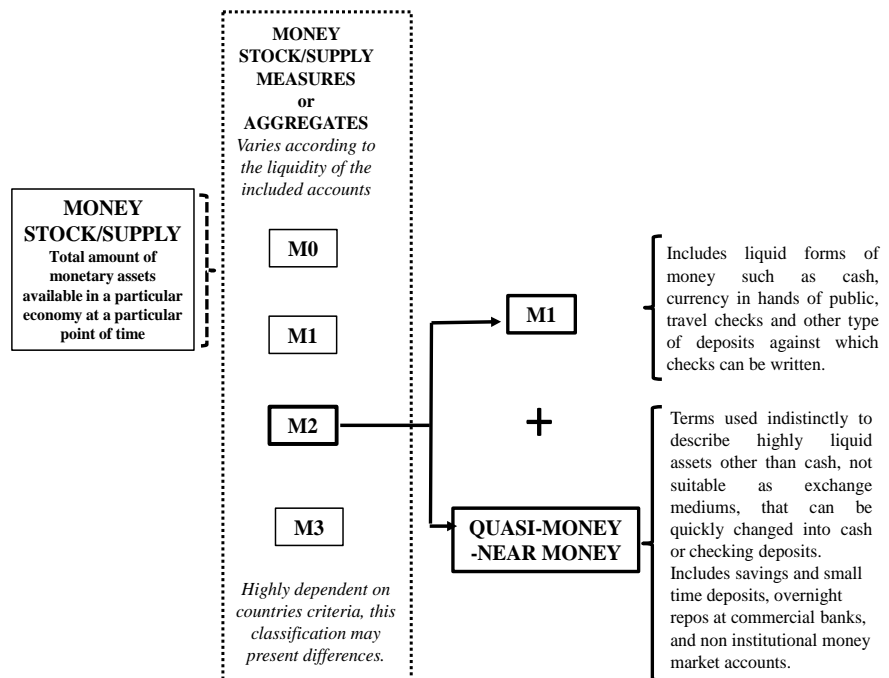


Figure 1. The configuration of Money Stock/Supply and M2 concept breakdown.

The concept of M2 defined by The World Bank provides general criteria to move forward in the referred research interest ...M2 includes M1 plus time and savings deposits with banks that require prior notice for withdrawal... [38]. M2 main measurement components are currency in circulation (M1), deposits redeemable at a 3 month up period notice, overnight deposits and deposits with agreed maturity of up to two years [39].

2.3. Framing Concepts' Interactions

The link formed by technology as new business models enabler of ECommerce kind, with emergent components such as the online money flows, drafts a basic complex contextual background presented in **Diagram 1**, describing the conceptual systems interactions, suggesting as well the related data required to address the importance of a deep understanding of the nature of the relation between the digital and the structural monetary components, and to take attention that, so far, there is no evidence that ECommerce online money flows are captured by country' Money Supply referred as well as Money Stock as an autonomous component particularly linked through many interconnections with its money aggregate (M2), specifically with its Quasi-Money/Near Money component. The intriguing question is if ECommerce money flows—identified as electronic/online money flows—affect involved countries' Money Stock by adding and/or subtracting monetary resources resulting from the operation of the emerging commercial model, or if local/domestic ECommerce money flows have an impact in the velocity of money, or if both of them are affected. The connection of the Technology-Business-Macro Economic systems has never been made

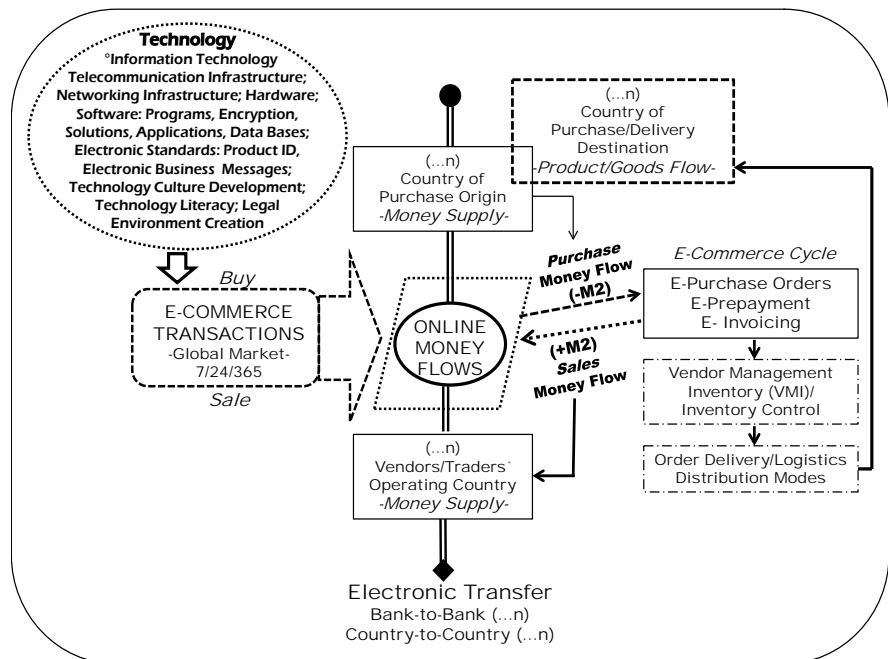


Diagram 1. Contextual background of the interactions of Technology, Business and Money Flows generated by ECommerce transactions.

possibly because figures with direct hard data—fact data—on ECommerce money flows fully disaggregated by country of origin to country of destination, are not available as result of the absence of Global harmonized measures and indicators on the matter in National Accounts Systems, —such as an ECommerce Trade Balance or an ECommerce Satellite Account by Country could be—as a means to monitor and control the effects over the economy and its main policies of such complex interactions. Following this order of ideas emerges a challenging analytical perspective connecting Competitive Theory, Technology Use Theory and Monetary Theory, which could contribute to draw focus of attention to changes in economic paradigms that technology is constantly raising globally.

3. The Systems' Interaction

The research interest presented in the contextual framework draft suggests the interaction of three heterogeneous and autonomous but interrelated dynamic systems,—technology, business and money flows—revealing some type of order, as result of such interactions, identified with the Complex Systems perspective. This view is considered to be adequate to benefit the initial conceptual framework by organizing its complexity as a general frame to work along the process followed to determine Propositions that could make a contribution addressing this challenging issue. Complex Systems definition [40], as well as its view over its application to Social Sciences [41], declare that they exhibit properties that emerge from the interaction of their parts and which cannot be predicted from the properties of the parts, as identified with the interaction of Business System and Technology System that is expected to be extended to the Monetary System as a final effect. This view is consistent with the complexity approach of economics in which it states that what happens in the economy is determined by many dispersed, possible heterogeneous agents acting in parallel, with no global control interactions, which are instead provided by mechanisms of competition and coordination among agents [42]. The revision of the contextual framework of **Diagram 1**, lead to identify that as a result of the interactions of the three systems involved in the research interest, a type of order is exhibited providing basis to consider the presence of a complex system supporting the reserch focus of interest, as presented in **Diagram 2**.

The introduction of complex view perspective is considered to be necessary to identify properties that emerge from the systems interaction, which cannot be drawn from the properties of the parts as a unit. The first of these interactions corresponds to Technology System/Business System that leads to the ECommerce business model's emergence. Understanding a business model as the general term describing how a firm creates, deliver and captures value to/from market opportunities, the Business System in this research is identified with *Electronic Commerce* (ECommerce) as a general frame of reference for electronic business models operating transactions in which the sales of goods and services are completed, where the buyer places an order, or the price and terms

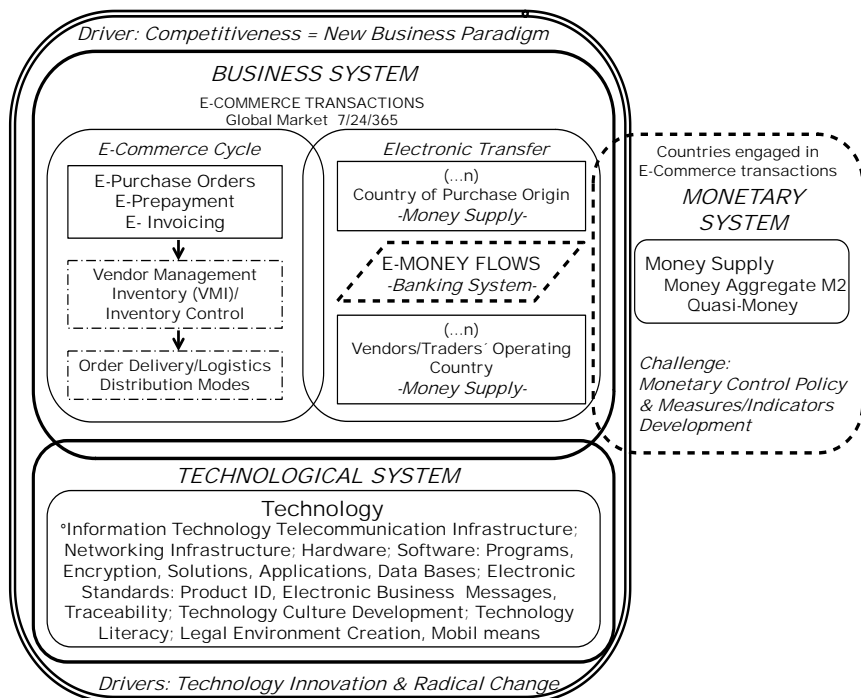


Diagram 2. Business, technology and monetary systems interactions in E-Commerce Business Processes Operations.

of the sale are negotiated over Internet networking, extranet, proprietary networks such as Electronic Data Interchange (EDI) network, electronic mail, or other comparable online system. Embedded in ECommerce transactions are key operational business functions such as digital marketing, inventory management, dispatch and delivery programming, sales register by item, volume and money indicator taking advantage of existing ID product and communication standards (GS1), accountancy registers and electronic invoicing, all of them configured as a commercial cycle that starts with electronic order management, payment moving forward until close with the electronic invoice issue, at the heart of this operations online money flows do their bit.

In this complex research context, a word of attention is required regarding the phenomena in which the interest is focused. Due to the nature of the money flows involved—identified as highly liquid assets moving by electronic means in/and to countries' Money Stock (Money Supply), the key component to conduct the analysis are *online money flows* created by the transactions executed in a Business System referred to as *ECommerce*, understood as defined in the US Census Bureau [43] operated in three main types of business models on the Web [44] Business-to-Consumer transactions (B2C) as in webpage-store business model; 2) Consumer-to-Business transactions (C2B) as a service platform-business model where the customer post a requirement and business bid on that requirement; and 3) Consumer-to-Consumer transactions (C2C) where the service-platform business model support transactions through sites offering auctions, free classified, and forums where persons can buy and sell using *online*

payment systems. This definition is considered to benefit the research analysis bringing accuracy to the term “sale of goods and/or services” component of the broad definition introduced into the business model perspective. Money flows derived from personal transfers, investment processes and banking transactions are a different matter of analysis, out of this research study’ boundaries.

Ecommerce business models’ operation starts with the mentioned technological system configuration based on Information Technology infrastructure required as the support platform for enabling connectivity, communications, products/sender/receiver identification and traceability, and money transfer transactions between and among business partners operating in an electronic based processes context. Driven by innovation development, Technology System has produced major breakthroughs in fields such as communications infrastructure that extended Internet use as the open channel for business interactions, solving technology investment problems that existed during the EDI private network era that provided access to electronic business interactions to limited number of big businesses’ partners. The advent of XML standardized electronic messages, opened the doors for information flows management of the business cycle by online means paving the road for ECommerce diffusion as a new business model—linking the technology system to the business system-, that soon was perceived as a solution to create and rise profit growth. Innovation on the matter has extended to Product ID standards in the form of Electronic Product Code (EPC) that enables cost efficient operations such as product traceability along the order cycle management, logistics, delivery and fulfillment operations required to honor the promise of ECommerce sales, as well as electronic transfer solutions that created new payment schemes operated under integrity and security conditions within and across countries. From this operational interdependence, the link between these two systems emerge due to the diffusion of ECommerce business models that fuels the adoption of technology-based processes and business practices of the kind of Supply Chain Management (SCM) accelerating the use of technology as business enabler and support. Such changes contributed to a technology culture creation in which trust, confidence and efficiency are characteristics.

Under the clear understanding of the first interaction between Technology Systems and Business Systems, a second interaction with the Monetary System takes place forming a network shape of links as presented in **Diagram 3**. The operation of ECommerce business models under a cross border environment, leads to the creation of money flows resulting from online payment of the transactions realized, and from derivate activities such as Logistics and Fulfillment operations, generating either a positive or an adverse effect over the correspondent country’s Money Supply mainly through electronic payment schemes (Electronic Transfer) and/or still directly by the banking system.

ECommerce transactions shapes a loop involving *sellers* placing and taking orders over the Internet, *transaction partners* such as physical movement enablers, banks and institutions that offer transaction clearing services, as well as

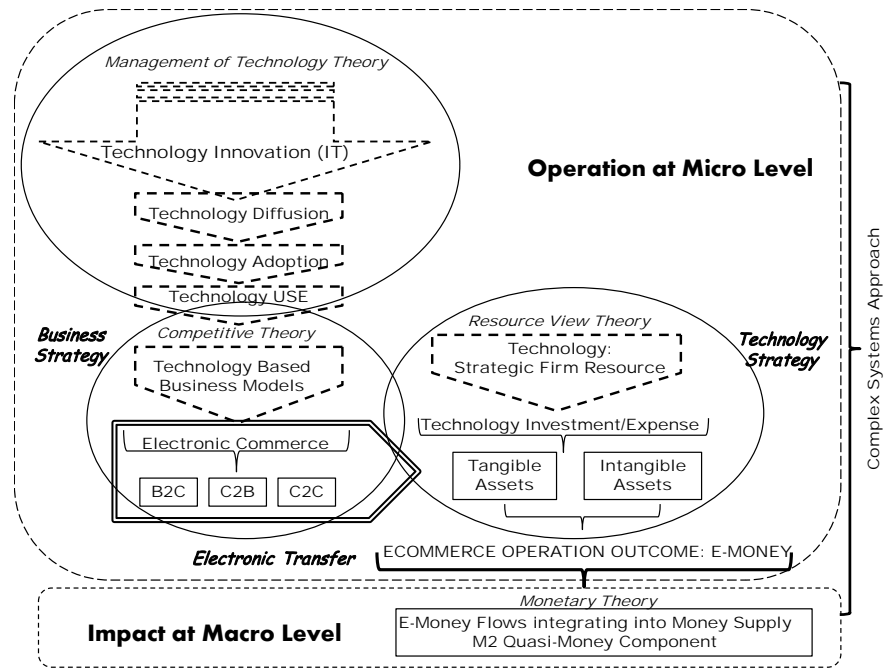


Diagram 3. Complex Systems Perspective. Theoretical Interaction supporting research oriented to explore the nature of the relation of online money flows with Money Supply.

authentication authorities playing as a third party to validate integrity and security of those transactions,—and *customers* with a mindset to search-select-purchase goods available online by means of electronic devices and pay for them using Electronic Transfer schemes. Known as commercial cycle, the loop is framed by Governments' legal dispositions and infrastructure built for this purpose such as electronic signatures assignment-management-control, electronic invoices, and laws and regulations as means to protect consumers and businesses involved in such transactions [45]. This commercial cycle operation is supported and enabled by the Technology Infrastructure constantly updating due to innovations. The emergence of business models enabled, supported, derived, and/or designed in/by/from Information Technology infrastructure led to the foundation of a new business paradigm that operates in parallel, as substitute, instead, as complement, or independent to traditional business models.

The Complex Systems view of the research interest results to be suitable to provide sense to dispersed concepts working under the same roof by introducing an order to leads to identify theories behind the systems interaction, as a first step to build a theoretical referent to be used as a base to perform Theory Matching or Theory-Data Dialogue. **Diagram 3** shows the interaction among sets of concepts from Management of Technology Theory and Competitive Theory working upon business strategy by means of new business models conception—such as ECommerce—introducing Resource View Theory as the executable support in which technology became a tangible and/or intangible asset at firm level, of strategic nature. So far theoretical interactions happen at micro-economic level, becoming a macroeconomic issue when emergent online money

flows reach country' Money Supply, being established then, a relation between the constructs from the two dimensions in which this research is interested.

4. Methodology

The stated focus of this study is on the *nature* of the relation between cross-border online money flows and Money Supply. Considered as a *technology creature* [46], created by IT infrastructure development and its use as business enabler in the emergent paradigm of Electronic Commerce' Business Models, with the ability to move independently on Global basis upon borderless conditions and timeless limitations, electronic or *online money flows* became an essential element of the Digital Economy identified as its monetary mass component matching the requirements to be used as one observable indicator for its measure. As such online money flows nature, as well as the nature of its relation with macro policy components of Money Supply sort and their correspondent measurement indicators, call the attention for a research exploration. The term *nature* stands for the fundamental qualities, the essential properties and/or causes of an individual phenomenon which in this case of interest is the relation stated. As the actionable verb, in this research *exploring* correspond to identify, collect and evaluate key issues of theory and available data to formulate a set of propositions that further on could contribute into theory building.

Consistent with the four main blocks of social research perspective [47] denoted as: The Analytic Frame, the Theories, data as evidence and the resulting new ideas generated by the analysis, this research process began by sketching a representation of the initial research idea framing its main components. When used to differentiate and/or classify key elements of the phenomena under analysis, such frame is identified as one of the *aspect based* type. Upon this basis, is reasonable to consider being the contextual framework developed as **Diagram 1** modelled through the Complex Systems interaction view as shown in **Diagram 3**, represents the Conceptual Framework to be operationalized in one Research Question addressed to cover the issue involving both micro and macro level dimensions. This framework is expanded and adjusted as the analysis moves forward into the theory matching stage.

RQ. What is the nature of the relation between online money flows and Money Supply?

The stated Research Question reveals the complexity of the context of analysis involving constructs and observable indicators from two dimensions, the first identified as a major component of the digital business dimension at firm level, while the second is grounded in the macroeconomic monetary policy arena of the Economy Structure dimension. To understand the relational statement presented, is taken into consideration that the analysis should be carried on in a context in which a) established theory cannot fully explain the new phenomena [48], b) the e-monetary mass component—online money flows—is not computed because is on the conceptual level, and c) hard-fact data on the *direction*

of e-money flows among correspondent countries involved in transactions of the kind are not fully available at the required disaggregate/granulated level. Under these constraints, the Grounded Theory Approach (GTA)—discovery of theory from data—is considered appropriate for analysis as focused on Theory generated by describing *what* happens and finding explanations to *why* it happens on the basis of observation leading to formulate Propositions that express a deterministic relation [49] [50]. The described approach gains understanding when considering the research characterized by being set in the Social perspective dimension [51]-identified by its Qualitative Research type nature [52]—using as a research strategy the Grounded Theory Approach (GTA) [53]—applying its procedures and techniques [54]. A key component of GTA method is abductive reasoning [55] [56].

Being the Research Question of this analysis focused in finding an explanation that cannot be explained by pre-existing theory, the abduction or abductive approach—understood as the process which starts with an observation to form explanatory hypothesis [57]—is used to investigate how far available data on the matter fits with the stated research subject identified at a crossroad of Technology Theory, Business Theories and Monetary Theory. Abduction is the pragmatic approach that implies the constant movement between existing theories and data,—the Theory Matching/Systematic Combining process approach [58]—making comparisons to identify deviations and patterns for further interpretation in the quest of possible explanations which could suggest new theory expressed by general rules, Propositions (P) or Hypotheses (H) [59] [60]. Here the knowledge rests upon observed facts, empirical events or phenomena related to a rule. The full process structured in a logic sequence that goes from *rule* to *result* to *case* [61], is considered a suitable methodological approach to identify how the stated propositions works in an empirical setting or case that supports a plausible conclusion considered to be as the best explanation.

To support the Theory Matching operations embedded in the selected method, as a second step of the research process, a Theoretical Framework was built to frame and contrast data with existing theories focusing in Online Money Flows derived from cross border Electronic Commerce activities. Data is collected by means of archival analysis technique from registers and statistical data on the matter published in the WWW—Internet access/direct request—by Government, Institutional and Ecommerce specialized Sources at World, International and Country level. Results are analyzed to identify characteristics of the nature of the relation between Online Money Flows and Monetary Supply components at country level framing the research in data of countries that account for around 70% of the Global ECommerce transactions. Insights on Money Supply data are based on statistics available online from The World Bank.

5. Theoretical Referent

The backbone for this research approach is configured by an array of theoretical

bodies from the Business arena, Management of Technology discipline, and Monetary Theory. This view fits with Electronic Commerce activities because each one of the systems involved in the research context has a supporting Theoretical Referent interacting with the others which is not completely suitable by itself to again understanding in regard of the determined phenomenon under study. The components of the complex theoretical frame in which the analysis is supported are organized as a necessary step to identify the role of each theoretical body in the structure of the research focus, being further used as the basic input of Theory Matching technique applied here to develop a set of Propositions.

Fine grains of the theories are identified to piece together in the theoretical jigsaw presented in **Diagram 4**, being the business arena the detonator of the phenomena. Competitive Theory [62] provides basis to understand new business models quest as profit generator means, supporting business strategies among whom emerge Market Development envisioned as a means to create feasible Global Markets, bringing a new customer base and/or extending the existing. To face the competitive environment, firms turns into the search of efficiencies in their resources among which the relevant contribution of Information Technology is the coordination of the firm's value chain either as a commercial enabler (E-Commerce) or/and as support of the inter-firms' operation of the business processes through electronic means, named E-Business [19]. The business view is related to the firms/competitors' internal organization perspective, coming from Resource View Theory tradition, the firm performance is determined by its resources [63] [64]. Technology is considered as a key strategic resource oriented

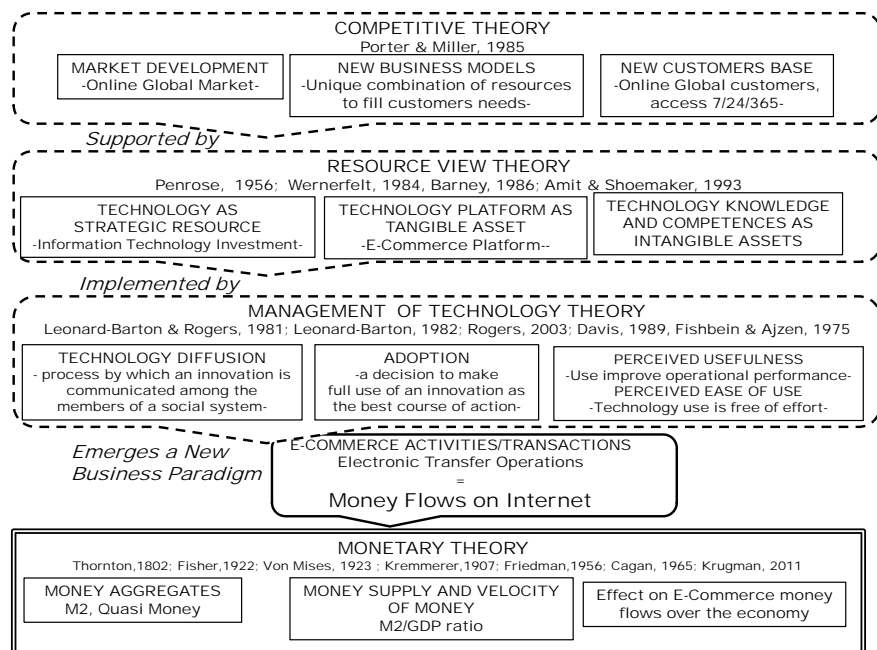


Diagram 4. Theoretical Framework developed to explore the nature of online money flows and Money Supply relation.

to support business strategies implementation as a means to gain efficiencies, reduce operational costs and built a unique a non-imitable defensive barrier against competitors [65].

In this business atmosphere, grows the recognition of the importance of Technology Innovation, recognized by Economic Theory—since decades ago—as source of economic development changes due to its role as production factor [66]. This view is extended when is accepted as strategic competitive resource, with its own management process of planning, investment and operational budget requisites, etc. As such, Technology Innovation is involved in diffusion processes among the members of a social system—either horizontally [67], or as a driver of change [68],—who eventually take the decision to make full use of it as business strategy enabler, support and/or production means [69]. Theoretical body from Management of Technology discipline suggests the feasibility of new markets development (Online Global Market), that leads to the creation of new business models (ECommerce typology) oriented to cover a new customer base (online customers) under new competition basis of 7/24/365 atomized countries attention (cross-country transactions), working under conditions of paperless monetary transactions (Electronic Transfers generating online money flows). To face the challenge, technology is considered a strategic resource to be invested either as a tangible asset (ECommerce platform/outsource) and as an intangible asset to be developed by means of knowledge and professional competences mastering [70].

E-Commerce activity depends upon decision making by consumers—the *use* of technology based sales channel, product selection, trust, etc.-, and from firms selling direct or through a third-party marketing mixes of products targeted to specific online market segments. Introduced by Davis [3], within the technology adoption requirements, the concept of Technology Use is declared to be an initial condition to improve firm's operational performance. Upon the basis of The Theory of Reasoned Action [71] the concepts of Perceived Usefulness (PU) and Perceived Ease of Use (PEU) are key determinants that lead to *use* a specific technology. Davis [3] defined Perceived Usefulness as the extent to which a person believes that using a specific technology will improve the operational performance, while Perceived Ease of Use is defined as the extent to which a person believe that the use of a specific technology is free of effort. PEU is related to intrinsic characteristics of Information Technology (easy to use and easy to learn how to use), while PU relates to extrinsic factors such as technology efficiency and efficacy, precious for the businesses to gain benefits from operating cost reduction.

Interactions of Business and Management of Technology theoretical referents provide sustain to the idea in which the diffusion of ECommerce business models follows an adoption cycle for users—from being part of the innovators or first to adopt segment, to the early adopters, the early majority, the late majority and the final adopters segment termed the laggards-, extending user's acceptance

span due to their usefulness in gaining operational efficiencies and access to new markets. Thus, matching theory with available estimated data of Ecommerce value amount, is reasonable to consider that ECommerce is becoming a competitive requirement in its way to be a common business practice, and that its trend of online money outcomes will continue to grow enlarging its transference to countries' Money Supply. The ECommerce-Monetary System connection emerges in user's adoption-acceptance-use of the technology figure of *Electronic Transfer* operations that refers to payment schemes over Internet that enables the operation of online money flows within and across countries. The percentage of a country' ECommerce purchased at foreign sites is known as Cross Border ECommerce [30] being this a business context of main interest for this research purpose the reference in this paper is extended to include sales and purchases recognized as the two ongoing transactions of trade supported by payment operations. Assuming that online money flows are captured by countries' total Money Stock, a relation is expected through the Money Aggregates that constitute the structure of Money Supply/Stock, referred to as M2. As previously stated in this research, within the M2 concept, money flows on the Internet are identified with highly liquid assets other than cash that can be quickly exchanged by cash known as *Quasi-Money*, Money plus Quasi-Money, Money Aggregate M2 or Broad/Near Money. The nature of the relation between the two monetary elements is the core interest of this research.

6. Formulating Propositions

The theoretical framework developed favors the view in which Technology Innovation in the figure of Information Technology developments, leverage business competitiveness by providing strategic resources that enable operational performance and creates new business models among which Electronic Commerce takes place. Diffusion of Ecommerce activities leads to the adoption of online business models as a new business venue either operating simultaneously with the traditional mode, or as new electronic business structures operating exclusively online. Being the new business model adopted with unprecedented dynamics, Technology Innovation shortens its development cycle to create a growing number of Technology solutions to fuel operation requirements to cover electronic transactions among all stakeholders and business partners engaged in Ecommerce operations worldwide. It is said that the moment of truth in business is payment, therefore electronic payment emerges by electronic transfer means creating a new creature: Electronic or Online Money Flows moving instantaneously among business partners operating in National, International and Global arenas. The observed theoretical interactions among Management of Technology/Resource View Theory and Competitive Theory notions, lead to declare a first Proposition regarding the effect of online money flows over Money Supply according to their direction in terms of country of origin and country of destination. Attention must be taken to the condition implicit in the Research

Question regarding the analysis of the *nature of the relation* of online money flows, resulting from *cross-border* ECommerce operations, with country' Money Supply.

Proposition 1. Under a cross-border ECommerce environment, Online Money Flows effect over Money.

Supply varies accordingly to the type of ECommerce transaction involved.

As a business operation, ECommerce broadly comprises online buying and selling transactions completed by payment usually made by electronic transfer modes. As this transactions could take place either in a same country and/or in different countries, it is reasonable to ponder that Money Supply receive different effects from online money flows generated in/within the same country than those online money flows generated by cross border ECommerce transactions operating as in a kind of misplaced pattern of trade in which the source and destination country of online money flows is not necessarily the same country in which the transaction is made, or the country from where the goods are shipped from or delivered to. Constituted by the amount of payments, *outbound* money flows are formed in countries where the purchase transaction is filed and steered to a country of destination where the payment is defined by the seller, being then recognized as *inbound* online money flows for that country of destination. The unique characteristic of ECommerce business model is that the money flows direction usually diverges from the direction of the physical flows of purchased goods to be delivered, introducing then, the key issue of the divergent patterns followed by the online money flows and their correspondent physical goods. For this reason, regardless the goods flows—registered traditionally by means of a Trade Balance account—, under cross-border conditions online money flows effect over Money Supply seems to be associated with their directionality, meaning that online money flows have a positive effect (adding) on Money Supply of countries of destination in which the payment by electronic transfer is received, a reverse or negative effect (reduction) on countries in which the purchase payment is completed or registered, and a neutral effect if transactions takes place within the same country or international economic block.

This proposition is identified as focused over the *what happens* with the effect of online money flows when considering their source of origin and their determined destination. Proposition 1 configuration discloses a deterministic relation in which concept (A) is considered to be a necessary condition—must be satisfied for concept (B). The model evolves in complexity due to the introduction of a *moderating* concept that *qualifies the relation* and links the two main constructs, representing (C) the type of ECommerce transaction identified as an import (generating outbound flows) or as an export (generating inbound flows). Here the effect of (A) over (B) exists or is stronger if (C) has a positive (inbound flows) or a negative (outbound flows) value. Proposition 1 relational model is put together as presented in **Figure 2**, containing two key relations in terms of necessary conditions: (1.1) There must be *A—online money flows directionality—*,

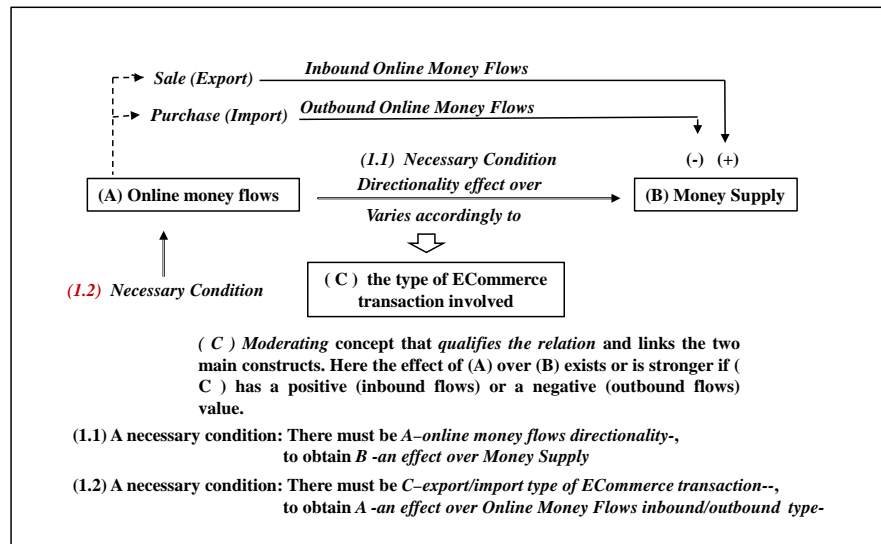


Figure 2. Proposition 1. Relational Model Configuration.

to obtain *B*—an effect over Money Supply—; and (1.2) there must be *C*—export/import type of ECommerce transaction—, to obtain *A*—an effect over online money flows—, to be related to *B*. In this relation is observed that Concept *A* (online money flows) is divided in two classifications (inbound/outbound) that dichotomizes this concept, generating a differentiated effect that leads to recode Concept *B* into a dichotomous concept (+/-) as well.

Property 1) Directionality. The rationale expressed above leads to consider *Directionality* as an essential property of the relation between cross border online money flows and Money Supply that could be stated as follows: Online Money Flows are related to Money Supply by adding or subtracting the absolute value of an ECommerce transaction according to its origin as online purchase or online sell operation. From the theory building perspective, Directionality property effect is measured by the positive or negative value amount of online money flows affecting Money Supply size. **Diagram 5** explains how Proposition 1 is operationalized.

Upper segment of **Diagram 5**, explains the connection between the electronic business cycle chain activities (order/purchase/payment/electronic transfer/confirmation/invoicing) from which paperless money transactions emerge and online money flows networks configured for its connection to Money Supply of countries engaged in such transactions. Aware that the physical movement of goods (storage, shipping, delivery, transportation, etc.) has an origin/destination pattern of its own, it is expected that cross border ECommerce Total Amount Value results became the net effect of online money flows over country' total Stock of Money, registered as growth or reduction of its M2 Aggregate the changes in its amount could have either a positive effect, a negative effect and/or internal compensation effect on Money Supply size and composition if ECommerce transactions are completed within a country. Lower segment of **Diagram 5** shows the bidirectional character of the connection when simultaneous

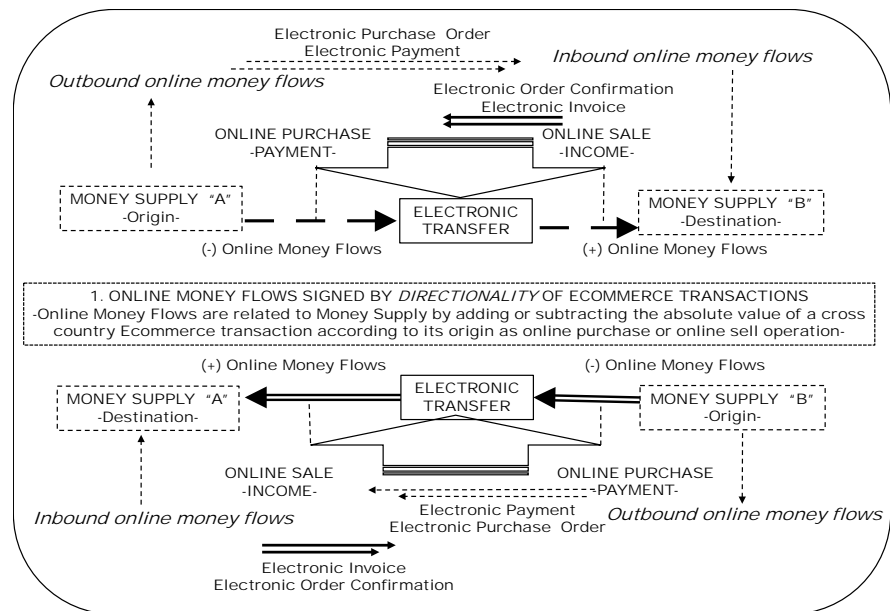


Diagram 5. The directionality property identified in the relation between online money flows and money supply.

executions of buying-selling operations by a same country are included, shaping in this way countries' online money flows network profile.

Property 2) Dynamism. As ECommerce activities grow in both directions-marked by simultaneous action in upper and lower segments of **Diagram 5-**, online money flows accelerate its frequency making money pass faster from one holder to the next. This dynamic connection is related to the concept of *velocity* of money that refers to the velocity by which money in circulation changes from one holder to other. The rationale behind this idea is framed by Money Theory. The concept introduced as *money rapidity* by Thornton [72], appears as main component of Fisher's [73] Money Theory as *velocity* (v), referring to the rate at which money passes in a given time period from one holder to the following. Monetary authorities explain that this *rate of turnover* of money supply or *money speed* measures the *number of times* that a currency unit (USD\$, RMB, \$MEX Peso, etc.) is used to purchase final goods or services included in the country's GDP [74]. The importance of money flows moving through Internet to their Money Supply destination is taken to a view through the lens of Quantitative Theory of Money assumptions [75] [76], that postulates that the amount of Money Supply has a direct, proportional relationship with the price level, inflation, the exchange rate and the business cycle [77], as it evolved into *Monetarism* [78] whose main statement is that there is a close and stable association between money supply and inflation, mainly because it is possible to avoid inflation with proper regulation of monetary base's growth rate. Quantitative Theory of Money has been challenged during one Century by figures of the field either arguing that Money Supply does not strictly determines the price level pointing that is focused on the supply of money without explaining the demand of mon-

ey, or providing reasons that even in the case of an excess of liquidity Money Supply has no measurable effect on prices [79]. The theoretical discussion of this issue and/or its effect is out of the scope of this research study. This property is identified as *Dynamism* in the relation between online money flows and Money Supply, observable in terms of the effect of online money flows rate of growth over Money Supply, as expressed in Proposition 2 as follows.

Proposition 2. Online money flows are related to Money Supply by creating a dynamic effect on the total amount of money when they are accelerated by cross-border Ecommerce activities growth.

Ecommerce market growth, as consequence of acceleration of the frequency of transactions among business partners, creates a faster movement of online money flows which is identified with the velocity of cash money in circulation. This proposition is oriented to identify *what happens* to Money Supply when online money flows increase their speed of growth, being for this reason identified as a deterministic relation of (A) and (B) that could be stated either as an increasing or a decreasing relation, even when it is a partly increasing/decreasing relation, under this perspective the relevant issue is one specific value for each (B) and (A) components.

Based on this reasoning, Proposition 2 is build up by a complex model based on a deterministic relation in which (2.1) online money flows low/high dynamism is a *sufficient condition* (A) if satisfied for Money Supply (B) growth/reduction. Complexity rises by the introduction of a mediating concept (Y) that links (A) and (B) concepts as *necessary condition* (2.2)—*there must be ECommerce dynamism*—to obtain (A)—an effect over online money flows value amount—.

As **Figure 3** describes, *if* there is an online money flows acceleration due to cross border ECommerce activities growth, (A), then there will be a (B) dynamic effect on the amount of Money Supply. In this relation the condition A and the effect B can each have only two values: the condition A can be present or absent and the effect of B can be present or absent, then there are three possible combinations, being the third one out of the scope of this research.

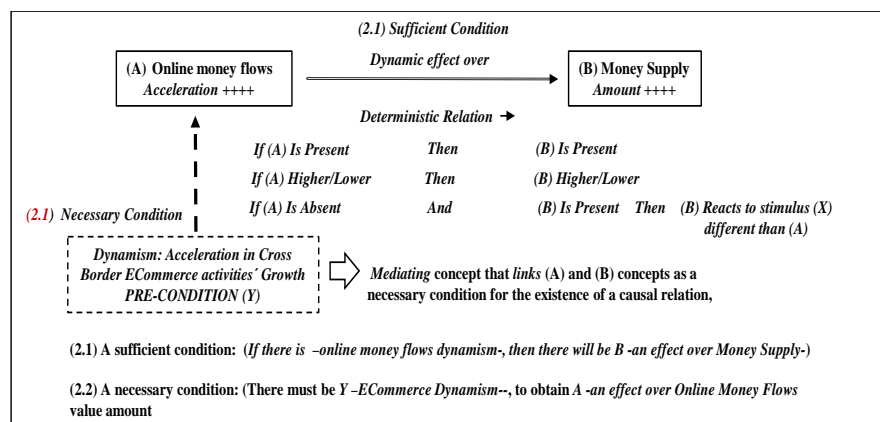


Figure 3. Proposition 2. Relational model configuration.

The configuration of the relations operationalized in **Diagram 6**, suggests that is reasonable to consider *Dynamism* as a characteristic of the relation existing between online money flows and Money Supply stated as follows: Online Money Flows are related to Money Supply changes in its total amount, because online money flows acceleration reflects the velocity of use of cash money in circulation—Money Supply’s, M1 Aggregate/narrow money stock—that is transformed into highly liquid assets other than cash that can be quickly exchanged by cash known as *Quasi-Money*/Near Money, being both of them M2 Aggregate’ components. In consequence, is reasonable to identify Money flows on the Internet with highly liquid assets other than cash that can be quickly exchanged by cash, known as *Quasi-Money*, being then favored the idea of the emergence of a new different component to be integrated into the Money Stock structure. This is a key finding, under the light of theoretical considerations sustaining that the proportion of transactions facilitated by quasi-money as medium of payment measured by the M2/GDP ratio is considered as a reliable macroeconomic indicator of Money Oversupply [80], because if money growth is outpacing the total economic growth, there will be a larger amount of money after the same amount of goods. The core component of the dynamism property relies on the notion that cross border ECommerce electronic money transfer is a process by which cash money in circulation (M1)—covering orders placed—is transformed into highly liquid assets other than cash, not suitable as exchange mediums, that can be quickly changed into cash or checking deposits referred to as Quasi-Money (M2), making reasonable to expect that the combination of the two forces—growth and acceleration—results in dynamic changes for Money Supply net value.

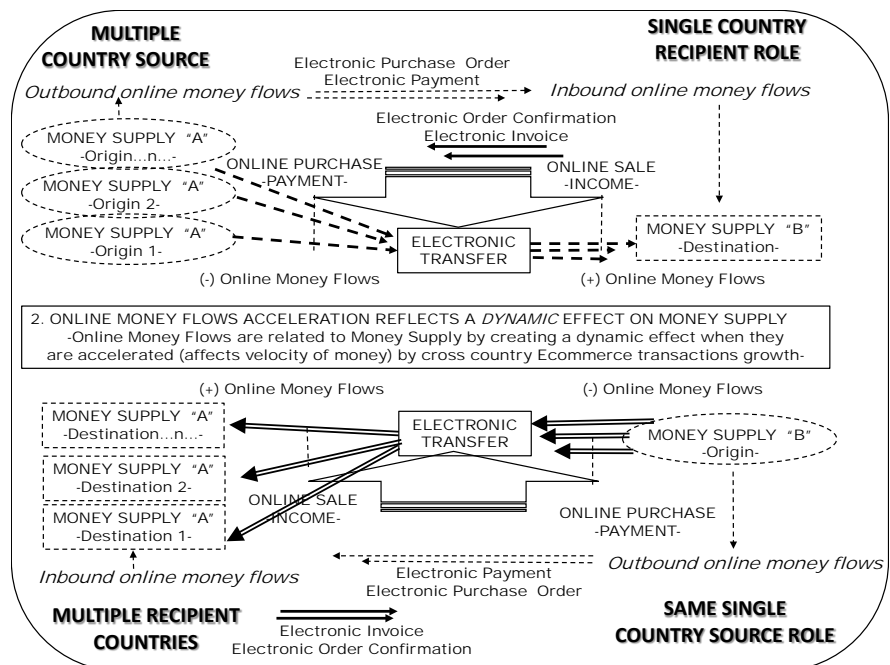


Diagram 6. The Dynamic property of the relation between online money flows and Money Supply.

3) *Intensity Property*. The diffusion of Ecommerce business models as well as the diversification of the models lead to a Global Marketplace creation with a growing number of countries acting as multiple source of payment when a purchase transaction is completed there. Such expansion generates outbound online money flows directed to recipient/destination countries where the money value of the transaction (payment) is registered, representing to the partner inbound online money flows introduced with different intensity.

To benefit clarity over the complexity of this relations, they are illustrated in **Diagram 7** identifying in the left side, as country' outbound online money flows, the value of the transactions in which the payment is completed. The block of countries registered in the left side became the multiple source of incoming or inbound online money flows to the recipient countries as represented in the right side of the diagram. A deep analysis following the lines of *Origin 1* of down the left side, indicate that its outbound online flows are connected to *Destination 1* and *Destination 2*, completing payment operations by means of electronic transfer. In that sequence of ideas, it is reasonable to expect that if the multiple country source expands (*Origin...n...*), the number of transactions will increase creating an effect over the value of inbound online money flows of the correspondent recipient country playing as seller in the right side. The described effect works on the other way when the multiple country source is reduced. The size of the total value of the number of transaction executed from one country to another is referred to as *intensity* considering it as the quality of having a strong effect as well as to the strength of something that can be measured [81].

ECommerce transactions growth may possibly be originated either by the expansion of prevailing ECommerce markets, as well as by the incorporation to

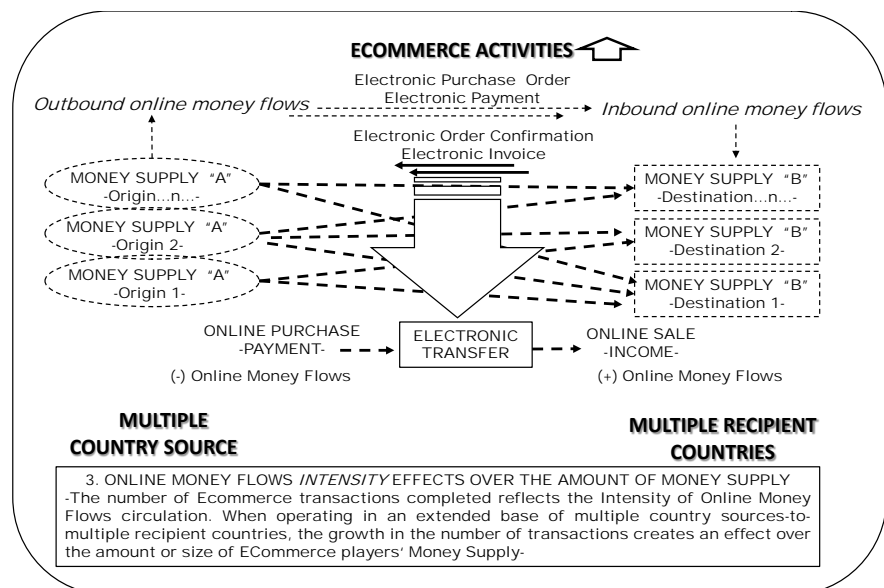


Diagram 7. The *Intensity* property of the relation between online money flows and Money Supply, under a cross-border environment.

these operations of new countries that introduce more Global suppliers and push forward the size of the customers base, thus generating an effect over the *number of transactions* implicated in cross border online money flows due to increasing payment operations. Intensity of transactions reflects in the amount of their correspondent online flows value, providing basis to the view of the extended effect over the Money Supply amount of countries engaged in the activity accordingly to the directionality property of online money flows and Money Supply relation. As previously explained in the stated research purpose, an explicit mention is given to the importance of the cross-border condition in which the referred relation is hold. Upon this reasoning Proposition 3 is stated as follows:

Proposition 3. The amount or size of Money Supply is related to online money flows reaction to the intensity of ECommerce cross border operations.

The rationale behind this proposition is that accordingly to ECommerce *number of transactions amount, or size and growth rate*, cross border online money flows amount has a changing effect over the amount or size of Money Supply value,—that eventually can be measured by means of quantitative hard data analysis—, suggesting a property of *intensity* in the relation existing between them. As stated, Proposition 3 is focused in the *what happens* to Money Supply amount when the amount or size of cross border online money flows is accentuated either by growth/reduction in the number of ECommerce transactions, as presented in **Figure 4**.

The Model in Proposition 3 structure, disclose a complex deterministic relation combining two types of conditions, being concept (A) a *sufficient* condition (3.1) for concept (B) if there are online money flows intensity (A) then there will be Money Supply (B) amount—requires to be enabled by (C) as (3.2) a *necessary* condition affecting (A)—there must be intensity in the amount size/rate of growth of cross border ECommerce transactions (C) to obtain an (A) to be related with (B). In this model other difference with Proposition 1 model is observed by the introduction of (C) a *mediating* concept that *links* (A) and (B) concepts as a *necessary* condition for the existence of a causal relation, being ECommerce cross border operations amount value size, or growth rate-referred

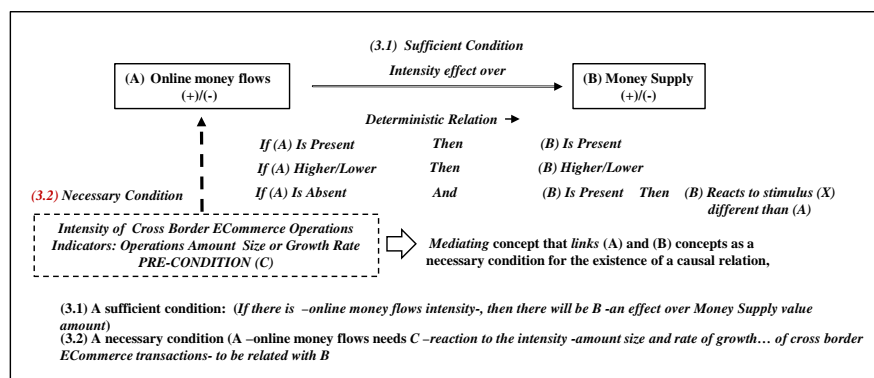


Figure 4. Proposition 3. Relational Model Configuration.

to as Intensity—component (C) to which online money flows amount value size, or growth rate directly reacts, with the consequent effect over (B).

4) *Structural Property*. As previously explained, Monetary Aggregates are key components of measures used for money supply and GDP comparison. Flows of money moving through Internet (Electronic Money, Virtual Money or Digital Money), by means of *Electronic Transfer*, are identified with Quasi-Money due to its characteristic of being liquid assets that can be quickly exchanged by cash. Considering this premise, if cross border ECommerce money flows are captured into M2 of countries engaged in such transactions, support is found for the idea that they could either reduce or fuel velocity and amount of this money aggregate. If so, attention must be taken to the changes provoked, because there is a light indicating that a danger for prices could be at sight.

This rationale supports the previous idea that cross border online money flows from ECommerce as introduced into engaged countries' money stock became a *new* M2 aggregate component that should be monitored through monetary police. Then, cross border ECommerce money flows play a role as liquid assets, being for that reason a *structural* component of Money Supply, in the clear understanding that they are not a new issued currency displacing or acting in parallel of any existing currency. Originated by ECommerce transactions worldwide, online money flows represent intangible, paperless liquid assets moving instantly across borders, by means of Information Technology infrastructure creating direct links between buyers and sellers enabled by electronic transfer schemes. These liquid assets are not identified so far with existing money aggregates included as Money Supply components, even though when they are fully accepted as money representation of transactions completed online. This order of ideas give significance to the notion of online money flows as a new and autonomous component of quasi-money or Money Aggregate M2, being then a *structural* component of a country' total amount of Money Stock (Money Supply), with a consequent effect—either positive or negative—over its structural configuration as well as on its size and growth rate. This implication brings visibility to the importance of online money flows in Money Supply, as a component of M2 revealing a *structural* connection, supporting Proposition 4:

Proposition 4. Online Money Flows identified as a new and autonomous component of Quasi-Money in Money Aggregate M2, has a *structural* connection with Money Supply with a resulting effect over its total amount and growth rate.

This proposition as is stated, is focused in the *why happens*, as changes are expected to happen in Money Supply amount, size and growth rate when online money flows are incorporated into its structure as a new and autonomous Quasi Money/Near Money component. The Model in Proposition 4 rises complexity featuring a network configuration by interweaving concepts and conditions from the previous propositions, shaping a single theoretical body of relations or online money flows effects theory. Starting from the basic *A affect B* structure

relation, identified as a deterministic relation (4.1) where *If A is higher, then B is higher*, being a *sufficient condition* linking A and B (4.2). The directionality property from Proposition 1 is introduced (4.3) as a means to distinguish online money flows' type effect on Money Supply as moderating concept (C.0) to *qualify* the relation in accordance to the positive or negative differentiated effects that the type of ECommerce operations produce as a necessary condition affecting A to be related with correspondent differentiated effects of (B), the relation is expressed as *differentiated types of (A: A1, A2) affects differentiated types of (B: B1, B2)* explained previously as dichotomy.

The model presented in **Figure 5**, describes how Proposition 4 evolves into two paths opened according to (C1) the sales-export-inbound online money flows process or to the (C2) purchases-import-outbound online money flows process affecting (A) to be related to (B). This differentiation is at the core of Proposition 4, as directionality moderates the effect of (A) on different Money Supply components (B1 or B2) or Money Aggregate M2 components as identified previously: M1 Aggregate/narrow money stock that is transformed into highly liquid assets other than cash that can be quickly exchanged by cash known as *Quasi-Money*. Upon this reasoning, Dynamism from Proposition 2, and/or Intensity of Proposition 3, takes their place as C0 (:C0.1-dynamism, C0.2-intensity) a *mediating* concept that *links A* (: A1, A2) and *B* (: B1, B2) concepts as a *necessary* condition for the existence of a causal relation (4.4). Being M2 the focus of interest in this research, the essence of this proposition is that the effect of online money flows on Money Supply is different for Money Aggregate M2 components: Quasi-Money/Near Money and M1, as identified in **Figure 5**.

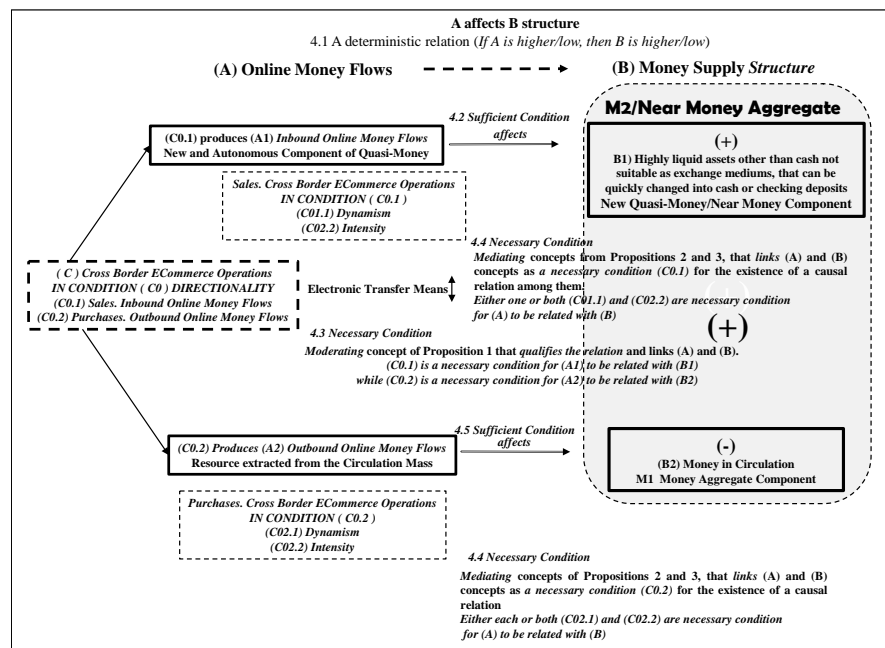


Figure 5. Proposition 4. Relational model configuration.

The relation stated in Proposition 4 introduces a new perspective into the research, as it provides a basis to ponder that online money flows—as M2 component might be acknowledged as the operational link between the digital/electronic commerce activities and the physical monetary structure of a country's economy, supporting the notion that being online money flows one new additional component of M2, they will be absorbed by a country's Money Supply—as already reported by the European Central Bank—, challenging so the idea of the presence of a new digital economy operating in parallel by itself. The introduction of Monetary Theory view into the research Conceptual Framework developed for this analysis, takes the initial Research Question into a second layer of analysis as follows:

RQ. What is the nature of the relation between online money flows and Money Supply *in its Money Aggregate (M2) component referred to as Quasi-Money?*

The hypothesized relations expressed by the set of four propositions could be considered as the foundation of the theory development process in which causal relations between two constructs are hypothesized under determined conditions. Each of the properties derived from the propositions formulated are actionable by observable measurement indicators as required by the research purpose. Results from the theory/data matching process realized to this point, provide an insight to the answer to this question, remaining implicit that online money flows refers to those derived from cross border ECommerce operations following a close loop type of movement that set in motion inbound flows for destination countries playing as exporters, and outbound flows for those in the purchaser side, creating a net value that is far to be quantified due to the general acceptance of E-Commerce *sales* value amount as indicator of the activity and/or to the absence of direct registers of the referred flows. The set of propositions formulated suggest that the relation between online money flows and Money Supply has four major characteristics: directionality, dynamism, intensity, and structural, that integrate the nature of that relation as a foundation for theory building. As displayed in **Diagram 8**, the *directionality (+/-)* property configures a loop due to inbound and outbound flows constantly affecting Money Supply by their *dynamism (xxxx)*—growth rate—and their *intensity (++++)*—number of transactions,—producing continuous change effects over Money Supply size due to the *structural (%)* characteristic.

7. The Analysis Results

7.1. Abduction Process. Stage 1: The Rule

A necessary next step in the selected research approach is to identify how the theoretical findings related to the Research Question works in the field of the phenomena interpretation. Following the abduction process sequence, in order to focus the analysis in the phenomenon under study a *rule* is identified from the analysis of Ecommerce key data estimations. The configuration of this rule is

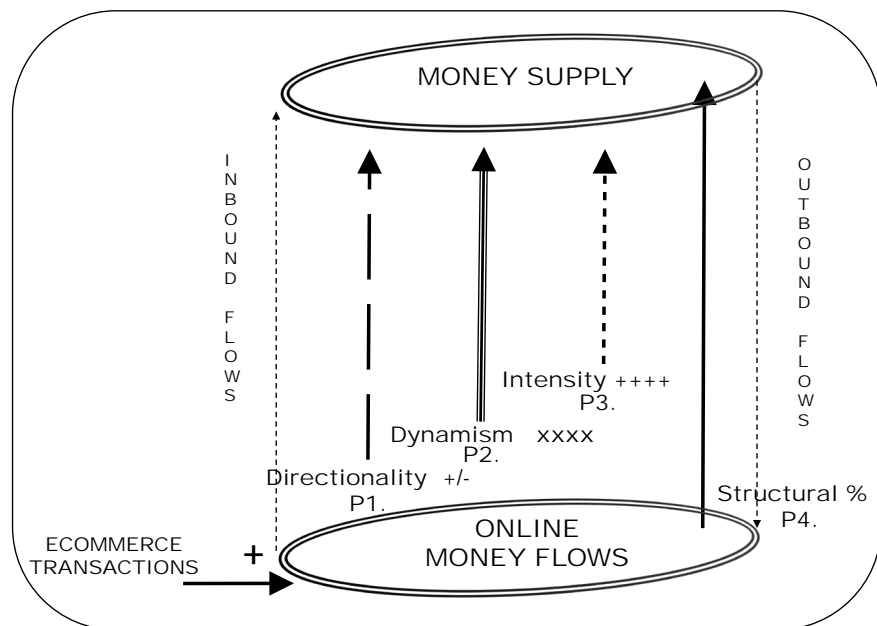


Diagram 8. Characteristics identified for the nature of the relation between online money flows and Money Supply under cross border ECommerce context. Basic Propositions set.

made by two main components: 1) the new business model based on a technology infrastructure operated with the purpose to gain benefits from a new market created on a Global basis—which is the microeconomic view—and 2) the composition of a macroeconomic policy component which is the country's Money Supply regulated as a Monetary Policy by Central Banks. Other meeting points of electronic money flows and macroeconomic policies are identified in Tax Policy, Trade Balance, GNP structure/composition and International Reserves among others. The interaction of the two elements is ruled by the fact that: each time a purchase or business transaction occurs—is completed—there is necessarily a matching money transaction completed by means of Electronic Transfer resulting in the creation of intangible online money flows circulating within and across countries 24/7, representing highly liquid assets other than cash identified as Quasi-Money in M2 Aggregate of Money Supply components.

The rationale behind this rule is provided by the shortening of Information Technology innovation cycle that led to the emergence of Internet as a public network infrastructure, the development of Product ID and electronic communications standards, software development and hardware design improvements. IT role in Internet moved from being a passive *informative* channel to be an active *transactional* channel with its own new payment schemes operating intangible online money flows in an emerging online market available $7 \times 24 \times 365$ to worldwide atomized customers requiring for payment methods using the same technology infrastructure. In this scenario market boundaries changed due to the emergence of a new mode of commerce termed Electronic Commerce/E-Commerce/B2C and to the development and adoption of new technology based interactive processes among business partners referred to as Electronic Busi-

ness/E-Business/B2B by a previously quoted text book [19], both of this new business practices require to close their commercial cycle by money transfer modes to be used through the Open Web. Under this context, emerged the *electronic transfer* as the highway to move money flows resulting from inter and cross border ECommerce transactions representing highly liquid assets other than cash moving either within a country and/or with a determined *origin in* or a *destination to* country' Money Supply.

7.2. Abduction Process. Stage 2: The Results

7.2.1. The Online Money Flows Insights

Moving forward in the abduction process, *results* in terms of data are incorporated into the analysis. The rule is supported by the available estimated data in regard of the amount of online flows created by ECommerce transactions, representing liquid assets related to Money Supply structural components, as revealed by the size of the online market in permanent growth, estimated by eMarketer in a range from 23%—per year in average from 2012 to 2015 [82] to 24% by Ecommerce Foundation for the same time period [33]. The relevance of this business mode is appreciated considering that in 2016 according to the mentioned first source, E-Commerce registered 26.4% of Worldwide buyer penetration in terms of population being Mobile payment, as well as mobile commerce solutions rapid changes, considered to be drivers of ECommerce' share significant growth. Latest numbers on the matter registered by the Ecommerce Foundation reveals descendent annual growth rates of 23.3%, 19.9% and 17.5% in 2014, 2015 and 2016, suggesting that the market is on its way to maturity [30]. The first referred source on the matter [82] provide data in terms of worldwide retail, considering that Global web sales accounted for nearly 6.4% in 2014 moving to 8.6% in 2016, forecasted to reach 12.8% by 2019, representing an estimated worldwide ECommerce retail money value estimated in year 2014 in US\$ 1336 billions growing to US\$ 2050 billion in 2016, with a projection to US\$ 3578 billion by the year 2019. Data from this same source [82] shows that China and the USA accounted for 55% Global internet retail sales during the period 2014-2016, leading world's Ecommerce during that time frame.

Comparing data sources, estimations in **Table 1**, from ECommerce Foundation reports from 2015 [33] and 2016 [30], expressed in Euros register higher numbers for the same years, as identified in the grow pattern moving from 1 895 billion Euros in 2014 to 2 273 billion in 2015 and a sales amount value of 2 671 billion for 2016. If this tendency is sustained, eMarketer forecasts could be closer than 2019. The use of data aggregated at macro level provides insight regarding the magnitude of ECommerce transactions worldwide, the money flows involved on it and the dynamic of its growth exposing the expansion of the business model and its influence over traditional commerce paradigm.

From macroeconomics indicators view, the share of Ecommerce in worldwide Gross Domestic Product (GDP) moved from 1.34% in 2011 to 3.11% in 2015 according to Ecommerce Foundation [33]. Data from **Table 2** disclose the

Table 1. Global ECommerce growth.

YEAR	ANNUAL SALES VOLUME. Bn Euros	GROWTH RATE %
2012	1196	23.6
2013	1537	28.5
2014	1895	23.3
2015	2273	19.9
2016	2671	17.5

Source: Table elaborated upon the basis of data from: ECommerce Foundation. Global B2C E-Commerce Global Report 2015 (pag. 9) and ECommerce Foundation. Global B2C E-Commerce Global Report 2016 (pag. 9).

Table 2. Share of ecommerce in regional GDP (%).

REGION	2014**	2015**
GLOBAL	2.60	3.11
Asia-Pacific	3.32	4.48
Europe	2.50	2.59
Latin America	0.83	0.77
North America	2.55	3.10
MENA* & South Africa	0.80	0.71

*MENA. Middle East and North Africa Source: Table elaborated upon the basis of data from: ECommerce Foundation. Global B2C E-Commerce Global Report 2015 pag. 12 and ECommerce Foundation. Global B2C E-Commerce Global Report 2016 pag. 14.

relevance of the activity according to geographical regions, suggesting business opportunities in the field. Asia-Pacific Region registered the faster growth in GDP participation moving from 3.3% to 4.48% from 2014 to 2015, followed by North America (2.55% to 3.10%). Europe shows stability while Latin America and MENA countries register a reduction of ECommerce in GDP participation. In terms of contribution to countries GDP, data from the same table reveals an asymmetry in the weight of ECommerce transactions by World Regions, being the highest proportion in Asia Pacific and North America as consequence of China and USA amount of participation identified on the matter.

The successful operationalization of the constructs involved in this research required as previous work to conduct data search oriented to separate data specified as correspondent to ECommerce, from those data labeled as Digital Economy. Supporting the operationalization of the constructs of this research interest, a word of awareness is introduced here regarding the differences between constructs as identified as follows by the brief insight into Digital Economy data, generated mainly by using surveys as a common methodology, with a data span focus based in regional or institutional grouping criteria-, as well as the example of a base of its measurement estimation. Registers of diverse type of statistics referred to Internet Economy or Digital Economy are identified, released by some country's statistics agencies such as The US Census Bureau [31], recognized consultancy firms of the kind of McKinsey Global Institute [32] and

Nielsen [83] Multy-country development organizations [7], as well as by country's specialized local associations as Pitney Bowes [84] and The Mexicsan Association for Internet, AMIPCI [85], being the most used data source firm's surveys—perceptions—focused on country's E-Commerce sales users, transaction type, product typology and/or about the Information and Communications Technology (ICT) industry. Reports of the last mentioned institutions include figures related to electronic purchases grouped by geographical region, the first revealing that from 1 243 surveyed persons, 57% of them declared to be engaged in international electronic purchases, from them 64% of the electronic purchases were made in the US and 36% in Asia, while Pitney Bowes online survey present results of e-shopping preferences for retailers outside their countries in Australia (63%), Canada and Russia (both 54%), in contrast, South Korea and China preferences are for retailers of their own country (21% and 19%), according to this source, shoppers preferences are concentrated on US firms (69% to 90%). The reports related to measurement of the *Digital Internet Economy*, from one of the sources mentioned above [2], provide figures of microeconomic issues such as users age and distribution by countries, as well as estimations based on calculations of the contribution of GDP via a classical macroeconomic spending approach where the use of the Internet Economy term is in reference to the sum of Internet consumption, private spending, public investment and trade balance in interrelated goods and services, and/or using diverse statistical econometric approaches.

Being stated that Online Money Flows represent the money value of ECommerce transactions completed, data search activities bring into surface the use of methodologies of wide diversity of criteria and data units that create variations in the resulting data released. During this research the most commonly used value units identified for ECommerce measurement are sales value and revenue value. To benefit from reliable data generated by consistent indicators being gathered along a reasonable time period,—unless other source mentioned—in this research ECommerce Foundation Statistical Reports are selected as main data source, under the criteria of recognized data quality based on their use as regional policies decision making support regarding ECommerce operation, proposed by the ECommerce Commission of the European Union. ECommerce Foundation annually provide solid statistics based on fact-data—such as in the 2015 Global Report [33]—related to 331 million of e-shoppers in the region of 28 country members, 84 million being cross border e-shoppers, from a total of 1 200 million e-shoppers worldwide-, and 4.0 billion parcels sent domestically and cross border countries (Europe), though private and public operators. Available data allows the analysis based on indicators regarding Global ECommerce value amounts in terms of sales value, growth, worldwide distribution, eGDP, basic market statistics regarding consumers and products, as well as data granulated by five economic regions and each of the countries members of each region considered by the source.

7.2.2. Propositions Support

Dynamism and Intensity Properties. From the analysis of data pattern behavior and composition, dynamism and intensity—as stated in Proposition 2 and Proposition 3—are identified as different properties of the nature of the relation under study. Regarding the dynamism property, **Table 3** built upon the basis of Ecommerce amount data disaggregated by country published by The ECommerce Foundation in its Global ECommerce Report of 2015 [33] and from year 2016 [30] shows that China, the USA and the UK accounts for almost 70% of Global ECommerce, revealing differences in each country's dynamism or growth rate as identified in China's higher dynamism/rapid annual growth pattern of 33.3% from 2014 to 2015 (Euros 538.1 bn to 766.5 bn) vs. the moderate of 12.1% annual growth registered in the USA (483.6 bn to 565.1 bn) during the 2012-2015 period, and the almost stable growth registered numbers of Canada (12.6%) during the same time period. In **Table 3**, little changes in dynamism/ growth are observed in Russia and Mexico' pattern, while in the numbers of Australia is possible to identify an example of countries with, both, less intensity and low dynamics. Japan numbers call the attention because even when the growth rate estimated for period 2011-2015 shows low dynamism (7.8%), the numbers registered in 2014 and 2015 suggests a contraction in the activity' rate of growth, as is observed as well in France, Spain

Table 3. Total ECommerce Sales by Selected Countries. B2C and C2C goods and services. Euros (bn).

COUNTRY	2014* bn	2015** bn	Global Participation % (2015)	Growth Rate % (2011-2015)	Ecommerce Share to GDP % +(2015)
GLOBAL	1 895.0	2 273.0	100.0	(2014-2015) 19.9	3.11
China	538.1	766.5	33.7	33.3	7.05
USA	483.6	565.1	26.2	(2012-2015) 12.1	3.32
UK	169.0	174.2	7.7	11.0	6.12
Japan	136.5	114.4	5.0	7.8	2.77
Germany	94.6	66.2	2.9	13.3	1.97
France	75.5	71.9	3.2	14.1	2.97
Canada	27.8	35.6	1.6	(2012-2015) 12.6	2.30
Russia	26.5	22.8	1.0	6.6	}1.17
Spain	22.5	20.2	.9	11.6	1.68
Australia	21.0	28.6	1.3	15.7	1.80
South Korea	20.2	64.8	2.8	11.0	4.70
India	19.4	25.5	11.2	129.5	1.1
Mexico	12.4	}} 13.3	0.6	(2012-2015) 30.0	(2013) }}0.57
South Africa		1.4	-	(2014-2015) 26.9	-

Source: Table elaborated upon the basis of data from: ECommerce Foundation. Global B2C E-commerce Global Report 2015 *(pag. 9). ECommerce Foundation. Global B2C E-commerce Global Report 2016 ** (pages 20, 32, 90) + ECommerce Foundation. Global B2C E-commerce Global Report 2015 *(pages 9, 42) }2014 Data representing Eastern Europe Countries: Russia, Ukraine, Bulgaria, Romaine and other countries }} ECommerce Foundation. Global B2C E-commerce Global Report 2014 pag. 35.

and Germany' ECommerce growth pattern. Special attention is required for South Korea and India registered data, which could be a result of differences in numbers of amount value and the time series data period consigned by the source used to build the table. Data from Mexico from the period illustrates a combination of both lowest dynamism and intensity. This analysis suggests four grouping criteria upon the basis of high, moderate, stable and low dynamism. Upon the basis of Proposition 3, considering that the data of value amount of each country correspond to the size of Ecommerce, here referred to as *intensity* of Ecommerce transactions completed, China is positioned in the 2014-2015 period as the country of the most intense activity during those years (538.1/766.5 bn), followed by the USA whose total amount value tails China's numbers with an expected gap enlargement due to differences in China's ECommerce registered growth rate.

The activity' Intensity in terms of ECommerce estimated amount has been so far used as an input to identify its contribution to the Economy in terms of GDP participation, as is identified from the available macroeconomic indicators [33] included in **Table 3.**, referring to an estimated ECommerce share to Global GDP of 3.11% in 2015. The meaning of such data is found by its comparison with the results of the participation of other components of the Economic activity, revealing a contribution close to the 4% registered for the Agriculture Share to Global GDP in 2016, far from the 27% share of industry, 12% of manufacturing and 69% of services share. In the data sources consulted any specific statement regarding the inclusion of ECommerce share in the services sector is found. Moving the analysis to country level, in 2015 is observed a major participation of ECommerce in China' GDP (7.05%), tailing agriculture share of 9%, and still far from industry (40%) and services (52%) registered for 2016 by the World Bank Group [86], followed by UK (6.12%) and the USA (3.32%) where this activity is larger than the agriculture share (1%), below manufacturing (12%), industry (20%) and far from services share to country' GDP registered in 79% for 2016. Similar pattern of GDP share distribution is registered by the UK. A word of awareness rises here upon the risk of the use of these estimations to formulate conclusions regarding causal relations out of the frame of each country' economic context set up by influences such as demographic composition, income, technology and commercial platforms availability, rate of technology adoption among users and diffusion of E-Business models among a wide array of other variables. The role of these data analysis in this research is to illustrate the estimated size amount of online money flows generated by Ecommerce transactions, as a basis to underline the importance of the analysis of online money flows influences on Money Supply structures as they behave in terms of *dynamism* and *intensity*.

Directionality Property. The importance of data availability on this matter is identified in **Table 4** built with data available from ECommerce Foundation reports for 2015 [33] and 2014 [87]. Expressed by this source in terms of the

Table 4. % of Cross Border buyers *purchased* in these countries' markets.

COUNTRY	2013*	2014**
USA	45%	47%
UK	37%	38%
China/HK	26%	31%
Canada	18%	17%
Australia	16%	16%
Germany	14%	13%
Total Amount (100%) Euros	105 bn	328 bn
Number of consumers	94 million	309 million

Source: Table elaborated upon the basis of data from: ECommerce Foundation. Global B2C E-commerce Global Report 2014 *(pag. 12). ECommerce Foundation. Global B2C E-commerce Global Report 2015 ** (pag. 9).

relative amount (%) of *purchases* made by the countries' buyers in foreign ECommerce sales markets,—referred to as *cross-border* Ecommerce,—the indicator is barely mentioned only in 2013 and 2014 reports of this source, reducing the possibility to identify cross border ECommerce traction. Representing one side of ECommerce transactions, the introduction of single purchase relative sided-data in the analysis creates a bias that could lead to inaccurate or incomplete interpretation regarding the composition of ECommerce markets, in terms of external and internal operations, due to the fact that such view is over half the phenomenon representing outbound online money flows from purchasing countries, being missed the side related to the inbound online money flows originated by sales transactions of the correspondent country. Using this sort of data as analytical reference, further analysis only takes to identify that close to the half of ECommerce transactions of the USA are made outside the country (47%) presenting a growing tendency (45% to 47%), while in Germany ECommerce transactions are dominated by internal operations (13% from 100% = 87%), registering a downsizing tendency (14% to 13%) during the two-year period. The astonishing data registered by the source, is the number of consumers' growth for six countries that moved from 94 to 309 million from 2013 to 2014.

As observed, to complete analysis of the cross border kind, even at a broad level, data of country' ECommerce sales are required to configured the full bidirectional path of an e-Trade Balance identified by both, the purchase and the sales directionality holding the notion that a key issue of this activities is the double role played by countries as online money flow source and online money flow recipient accordingly to the type of purchase and/or sales Ecommerce transactions in which they participate. The data type issue is identified in the other direction for US data focused on sales as explained by E-Stats of the US Census Bureau [88]... The e-commerce measures report the value of goods and services *sold* online whether over open networks such as the Internet, or over proprietary networks running systems such as Electronic Data Interchange (EDI). E-commerce data were collected by four separate Census Bureau surveys... In this context is applied as well the following definition by the US Department of Commerce presented in the Total retail Sales and E-Commerce by

the US Census [89]... E-commerce *sales* are the sales of goods and services where the buyer places an order, or the price and terms of the sale are negotiated, over an Internet, mobile device (M-commerce), extranet, Electronic Data Interchange (EDI) network, electronic mail, or other comparable online system. Payment may or may not be made online.

The lesson obtained from the prevailing differences in data composition, is that the absence of disaggregated data in terms of absolute numbers could produce biased, misleading, inaccurate or incomplete interpretation as is observed in the analysis regarding amount *purchases* of goods bought *to* foreign countries by means of ECommerce transactions expressed in terms of relative numbers in one source, and the second criteria based on *sales* absolute value amounts used by the second source mentioned. Data registered by mentioned ECommerce Foundation reports in this regard rises the convenience to create and capture full ECommerce cross border fact data in absolute numbers to be used as a standardized, reliable input for National Accounts Systems registers, as well as a basis of computing at country level the money flows resulting from this business mode and the resulting amounts of correspondent taxes such as VAT.

To explore how the framework works when is applied to Proposition 1 support, alternative data source providing disaggregated data of cross-border ECommerce origin and destination is identified, moving forward in the identification of the country' cross-border ECommerce profile by means of a map, remaining implicit that dealing with online money flow issues, inbound online money flows data correspond to *recipient* countries, while the sales transaction could take place in one country and the correspondent collection of payments could be concentrated in one or in several different countries. The Paypapers ECommerce Reports released with available data estimations of eCross-Border activities for 25 countries—at the moment—are identified as the source of data, recognizing that although expressed in relative terms (%) it is the nearest match to the type of data required for this research purpose. Following an operationalization strategy three countries reports were requested to the source as basis to collect data presented in **Table 5**, using selection criteria in which three countries are selected representing one major ECommerce world market (China) [90] and two countries with ECommerce activities in different stages of growth: South Africa [91], and Mexico [92]. Each selected country is from a different continent and economic region. Organized in **Table 5**, cross-border ECommerce data disaggregation of the selected countries presents limitations at first glance regarding its expression in percentage units keeping the real amounts (intensity) without disclosure thus, eliminating chances to build eTrade balances patterns for each of the countries' transactions, and presenting inconsistent data of correspondent ECommerce purchases as identified for China and Mexico in the right column. Being noticed data composition characteristics, as means to identify how the theoretical findings works in the interpretation field, useful data from South Africa are used to conduct a first exercise shaping an ECommerce

Table 5. Cross-border ecommerce. selected countries profile. 2014.

COUNTRY	ECommerce Sales <i>to</i> (%)		ECommerce Purchases <i>from</i> (%)	
	-Inbound online Money Flows-		-Outbound online Money Flows-	
	<i>Export Markets</i>		<i>Import Markets</i>	
	US	17.2%	US	84.0%
	UK	16.3%	Hong Kong	58.0%
		+	Japan	52.0%
	Brazil, India, Germany, France,		UK	43.0%
CHINA	Russia, Japan and South Korea		Australia	39.0%
	China	8.3%		
	US	8.1%		
SOUTH AFRICA	India	7.8%	US	27.1%
	UK	7.2%	Europe	14.6%
	US	70.0%	US	87.0%
	Canada	5.4%	China	14.5%
MEXICO	Spain	2.1%	Hong Kong	7.8%

Source: Table built upon data from Reports obtained by direct request to the source. Retrieved in July 1, 2017 The Paypapers (2014). CROSS-BORDER ECOMMERCE REPORT. China pag. 7 The Paypapers (2014). CROSS-BORDER ECOMMERCE REPORT. South Africa pag. 8 The Paypapers (2014). CROSS-BORDER ECOMMERCE REPORT. Mexico pag. 8.

profile map for the country, to frame the directionality analysis in both ways. Being identified minor adjustments required the framework of analysis, as well the released data constraints, the Case was developed further on selecting Mexico as the unit of analysis, illustrating that how the framework operates as a solid analytical setting, regardless the contextual data characteristics mentioned previously.

Applying the framework of analysis to South Africa (SA) data as an example, the obtained results allows to identify its total ECommerce structured by 84.3% of internal transactions and the remaining 15.7% by cross-border operations, reflecting a general internal adoption pattern that could be an interesting starting base to leverage internal market expansion in the matter. Focusing in the 15.7% of the cross-border operations, the profile suggest an opening stage of market activities in both selling—registered in the second column of the table—and buying activities registered in the third column, being an interesting observation that the *sales* span is extended to four countries configuring a set that represents 30% of the total of 15.7% of the cross-border operations registered by the source while 70% correspond to atomized transactions revealing low level of adoption of business models of the type. The group of country-customers (purchases are originated from this countries) became a dominant market group with a balanced participation of China, USA, India and UK in a range from 8.2% to 7.2%, representing online money flows moving from each country to SA as Inbound online flows—unknown in absolute amounts due to the source's data expression in relative numbers—to be incorporated into SA' Money Supply structure. Deeping into the analysis, results suggest that the purchases of the block of four

countries registered in the second column of **Table 5**, represent a minimum cross-border activity of SA as *seller* country, because 15.7% out of 30% is about 4.5% of total ECommerce transactions of South Africa providing support to consider that each country purchases represents around 1.1% of this total and as consequence—and in consistency with data from previous **Table 3**—making reasonable to consider that they represent absolute amounts with expected minimum influence over M2.

As observed in the example, the framework operates as a solid infrastructure for the analysis, while the level of data disaggregation from the source rise barriers to go deeper into the specific analysis' interest as is viewed in the identification of the country of origin of the remaining 70% of inbound online money flows resulting from South Africa' cross-border ECommerce transactions, its atomized pattern, or the amount (intensity) in absolute numbers of internal transactions representing the mentioned 84.3% of the country' total ECommerce amount. Working as an analytical tool to build the *Case* required by this research process, the framework developed is applied to a country selected as unit of analysis for its data interpretation in terms of directionality and intensity properties, by modelling a map of the country's ECommerce operational profile, being the analysis of dynamism (growth pattern) and structural (influence on M2) properties conducted with data of complementary monetary sources.

7.2.3. The Monetary (M2) Component Insight

Structural Property. Upon the basis of the rule set to conduct the data analysis under the abduction approach, is feasible to consider that the estimated numbers resulting from ECommerce measurement mentioned above, reflects the amount of online money flows moving from one country to another using Internet as money transfer channel, indicating an impact over countries' total stock of money in the economy, specifically over the amount of money in circulation referred to as M2 Aggregate. Following the abduction process, the analysis lead to identify the alignment of the phenomenon under study with the stated rule, supporting the notion that ECommerce money flows are captured by M2 as a new and autonomous component linked through interconnections with Quasi-Money components, being reasonable to identify online money flows as a structural component of the total amount of Money Stock. These findings suggests that the relation between online money flows and Money Supply has a *structural* nature, as stated in Proposition 4.

Extending the attention to the Monetary component of the analysis, data from M2 from selected countries from the set included in **Table 3** (ECommerce amount value), are collected to explore how far the analysis could be taken under the current context of data availability. Data organized in **Table 6**, based on World Bank data [93], intend to bring some light upon this subject. In a first glance, it is observed that as are registered, data are not comparable with ECommerce size due to differences in the observed time series availability and to the reasons already discussed regarding the ECommerce data disaggregation

Table 6. Money Aggregate M2 Grow Pattern. Selected Countries. 2010-2014. (Local Currencies, billion).

Country	2010	2011	2012	2013	2014	2015
Australia	1,310,309	1,414,712	1,518,664	1,621,130	1,735,142	1,838,975
China*	72,585,179	85,159,087	97,414,887	110,652,500	122,837,483	139,227,813
Germany**	2,165,106	2,284,845	2,421,224	2,505,487	2,613,274	n.a.
Japan	1,088,226,100	1,119,685,400	1,144,131,000	1,184,181,100	1,219,690,000	1,255,861,500
Mexico	5,960,458	6,628,801	7,285,217	7,895,722	8,910,628	9,648,505
Russian Federation	23,791,200	28,485,900	32,205,700	37,368,700	42,909,600	51,370,300
USA	12,769,791	13,622,094	14,289,708	14,913,208	15,671,169	16,205,230

Mexico exchange rate: \$USD 2010/ 12.64, 2011/12.42, 2012/13.17, 2013/12.77, 2014/13.29, 2015/17.40* Without Hong Kong & Macao **Based on data from <http://data.worldbank.org/indicator/FM.LBL.MQMY.CN> Retrieved September 25, 2015 World Bank Note: M2 corresponds to lines 34 and 35 in the International Monetary Fund's (IMF) International Financial Statistics (IFS). Data are in current local currency billions. Source: Table elaborated upon the basis of data from: The World Bank Group 2015. The World Bank Catalog Sources, World Development Indicators. 2015. Series FM.LBL.MQMY.CN <https://data.worldbank.org/indicator/FM.LBL.BMNY.CN?view=chart>.

level required to move into comparison operationalization. Being aware of data differences, in order to explore the feasibility of the comparison of the two components, borrowing a term from programming field the analysis is moved into a *mock object* scenario simulating that the behavior of the series of ECommerce amounts and M2, mimic the behavior of real online money flows by country and correspondent M2 in a controlled way. In consequence, as the structural property relates to the role of online money flows in the composition of M2, the identification of growth pattern emerges as the first analysis required to provide basis of its comparison with online money flows dynamism (growth pattern).

Under the previous mentioned premises awareness, data from **Table 6** show differences in M2 growth pattern, being Australia and Japan the countries with an observed moderate growth in the period, while data from Mexico and China reveals high acceleration that almost doubled M2 from 2010 to 2015, opposite to the M2 amount of Germany and the USA with moderate growths registered in the periods referred. A third pattern is identified for the Russian Federation presenting an accelerated M2 growth rate, which surpasses the double in the time period analyzed. Comparison of these patterns with **Table 3** E-Commerce growth data patterns, as visible in **Figure 6**, leads to identify at first glance that (a) for all countries the ECommerce growth pattern line is *below* the line of M2 growth, and (b) differences in the two growth patterns produces a gap differentiated by country, being the smallest gap (b1)—less than double-identified Germany (13%EC/20.7%M2), a second group of countries with an observed gap close to the double size (b2) is configured by Japan (7.8%EC/15.4%M2), The US (12.1% EC/26.9%M2) and Mexico (30.0%EC/61.9%M2), while countries with no similarities found between the two components' growth patterns—largest gap—create a third group (bc) integrated by Australia (15.7%EC/40.2%M2), and China (33.3%EC/91.8%M2). The Russian Federation presents a fourth pattern (bd) in which ECommerce growth (6.6%) is *far* back from M2

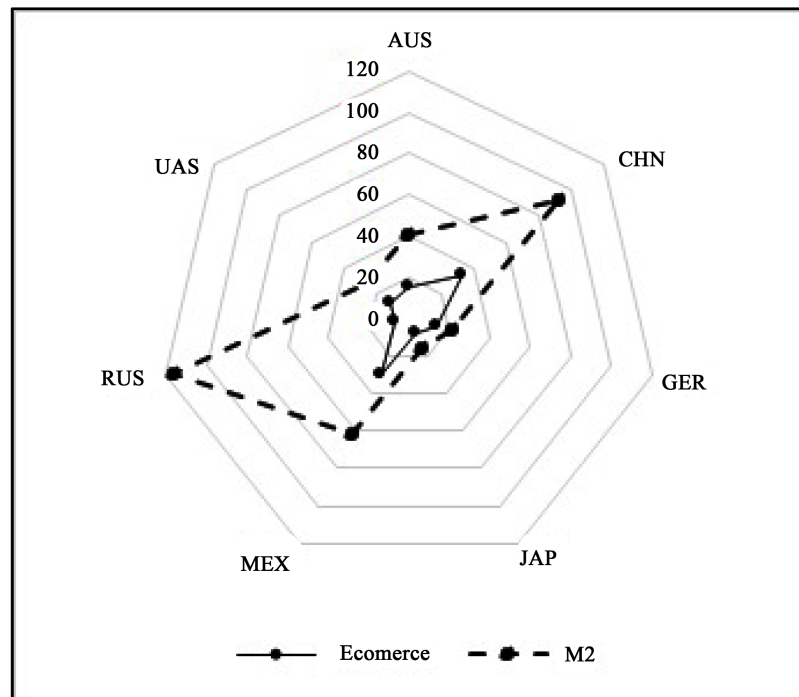


Figure 6. EC and M2 Growth Rates Patterns Comparison (2010-2015). Selected Countries. Source: Elaborated upon data from EC and M2 growth in period 2010-2015, registered in [Table 3](#) and in [Table 6](#).

growth registered in 115.9%.

Although this initial analysis results are promising, to gain full benefit in the interpretation field of Proposition 4 relational model still is required specific E-Commerce and M2 data input, the first from the outbound online money flows originated by the purchase operations to identify its impact over M1—as a component of M2—, as well as standardized data from inbound online money flows created by E-Commerce sales operations.

7.3. Abduction Process Stage 3. The Empirical Setting or Case

As the full abduction process is supported by a logic sequence that goes from *rule*—to *result*—to *case*, in the final stage of the process the set of Propositions formulated are applied in an empirical setting or case that supports a plausible conclusion [54]. Focusing in this research purpose, the process is completed by a case developed to explore how the propositions formulated are actionable by observable measurement indicators, using data from a country selected upon the criteria of emerging activities in the matter, and a reasonable data size for model diagramming. Addressing the first research purpose, working as an analytical tool, the framework developed is applied into an operational example using for such a purpose data from South Africa registered in [Table 5](#), in order to identify if the framework developed supports data interpretation by shaping a country' cross-border ECommerce operational profile.

Applying the framework reasoning to the example, [Diagram 9](#), shows South

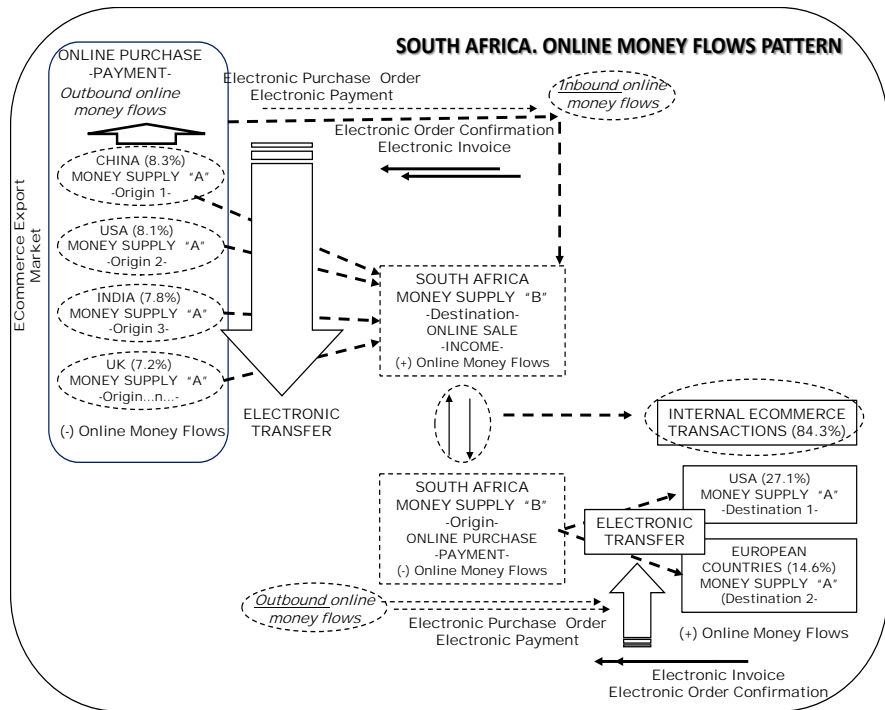


Diagram 9. Framework for analysis. directionality and intensity properties. Mapping a country’s ECommerce operational profile. Operational example, South Africa. Source: Elaborated upon data registered in **Table 5**.

Africa’ (SA) total ECommerce configured by 84.3% of internal transactions and the remaining 15.7% by cross-border operations, reflecting a general internal adoption pattern, that could be interesting to leverage internal market expansion in the matter. Focusing in cross-border operations, the profile suggest an opening stage of market activities in both selling—registered in the left—and buying activities registered in the right, being an interesting observation that the *sales* span is extended to four countries configuring a set that represents 30% of the total of 15.7% of the cross-border operations registered by the source. This group of country customers (purchases are originated from this countries) configure a dominant market group with a balanced participation of China, USA, India and UK in a range from 8.2% to 7.2%, representing online money flows moving from each country to SA as Inbound online flows—unknown in absolute amounts due to the source’s data expression in relative numbers—to be incorporated into SA Money Supply structure. Deeping into the analysis, results suggest that the four countries’ purchases registered in **Diagram 9**, represent a minimum cross-border activity of SA as *seller* country, because 15.7% out of 30% is about 4.5% of total ECommerce transactions of SA providing support to consider that each country purchases represents around 1.1% of this total and as consequence—and in consistency with data from **Table 3**—making reasonable to consider that they represent absolute amounts with expected minimum influence over M2.

Under each of the purchaser country’ view, cross-border ECommerce transac-

tions made with South Africa represents outbound online money flows to be registered as a reduction of their total Money Stock at the operations completion moment, which in the case of the USA is a negative register to be contrasted with the positive inbound money flows generated by South Africa's cross-border Ecommerce of purchases made to the USA (27.1%) as consequence of the bidirectional characteristic of the relation identified between them. From the registered 14.6% of purchases made to the European Union, numbers from SA have a negative sign as no sales to this economic block are registered by the source. As observed in the analysis, the framework works as a solid infrastructure for the analysis, while the level of data disaggregation from the source rise barriers to go deeper into the analysis interest as is viewed regarding the identification of the country of origin of the remaining 70% of inbound online money flows originated by South Africa's cross-border ECommerce transactions, its atomized configuration, or the amount (intensity) in absolute numbers of internal transactions representing the mentioned 84.3% of the country's total EC amount. Successful results of the frameworks' application to data from South Africa, as means to develop an example, supports its use in the setting of Mexico's data to build the Case required to complete the abduction process.

The relational statement of Proposition 1—*Under a cross-border ECommerce environment, Online money flows effect over Money Supply varies accordingly to the type of ECommerce transaction involved*,—guide the search into the cross border level of data aggregation, from which two challenges emerge, first the absence of direct data is identified, and second the existing data usually are referred to/or mentioned as a proportion of the estimated ECommerce value expressed as sales, revenues or market value, resulting from survey application. For this reason, the operationalization starts by gathering the series of ECommerce Total Amount value, to frame the cross-border transactions participation. Selecting Mexico as the unit of analysis at country level, a word of attention rises regarding the data sources used. To benefit the analysis, two available data sources are introduced, even when both of them have their origin in survey estimations. For estimated ECommerce market value is selected the data series—presented in **Table 7**—released by the Mexican Association for Internet (AMIPCI) integrated in this research as the national data source [85].

From **Table 7** interpretation, a staggering growth in Mexico's estimated ECommerce market value is identified, as the tendency reach to 2015 with numbers ten times higher than those registered for 2009, revealing as well a high-level dynamism recognized by the annual growth of 59% registered from 2014 to the next year. The pattern of behavior observed in the data series indicates conditions of an accelerated market growth that produces a general dynamic effect of their resulting online money flows over the total amount of the Money Stock. Dealing with total amount series, to gain value from the data interpretation the analysis requires to be extended into the identification of the reasons beneath the market growth, because as a broad term it refers either to

Table 7. Mexico. ECommerce estimated market value*. (Mex Pesos bn).

Year	ECommerce Estimated Market Value (Mex Pesos bn)	Annual Growth (%)
2009	24.5	
2010	36.5	
2011	54.5	
2012	85.7	
2013	121.6	42%
2014	162.1	34%
2015	257.1	59%

*According to this data source 57% of EC purchases made correspond to international (cross border) transactions Source: Table elaborated upon the basis of data from: Mexican Association of Internet. AMIPCI. ECommerce Study 2016. Public Version pages 8 and 12.

the customers base expansion due to internal new customers integration, changes in the amounts/frequency, changes in internal and external current customers purchase behavior, as well as to new markets development adding new countries with new external customer base to the market span. Each of these conditions could produce a different effect over the Online Money Flows relation with M2, as observed when market grows due to the introduction of new countries into ECommerce models, the effects are over inbound/outbound online money flows affecting Money Supply size, while the effect of the expansion of internal customer base is identified in the velocity of the money in circulation. The described context denotes that the interpretation based on total amount data does not necessarily correspond to this research interest, therefore, the following step is to focus the analysis on the 57% of international transactions reported by the national source. What is intended is to underline here that the importance of the *cross-border* condition in which the hypothesized relation holds should remain explicit. This reasoning focusses the analysis perspective.

Taking into account that as a business operation ECommerce broadly comprises online buying and selling transactions completed by payment usually made by electronic transfer modes, these transactions could take place either in a same country and/or in different countries holding the idea that Money Supply receive different effects from online money flows amounts generated in/within the same country, then those money flows generated by cross border ECommerce transactions. The effect of external online money flows over Money Supply could be measured by the positive or negative value amount affecting Money Supply size due to the Directionality Property introduced by Proposition 1, as well as by the Dynamism property from Proposition 2, that states that as ECommerce grows in both directions (purchase/selling transactions) online money flows accelerate its frequency making money pass faster from one holder to the next, being this dynamic connection related to the velocity by which money in circulation changes from one holder to other.

From this perspective, the observable indicators are cross border ECommerce

data disaggregated by type of country as importer (purchaser) and exporter (seller), representing inbound and outbound online money flows for countries engaged in such transactions. To overcome a visible absence of direct available fact data, an international source [92] is selected as cross border transactions source due to the small redundancy effect of the data expressed in relative numbers, identified by their comparison with the national source. Such effect is observed in **Table 8**, as data expressed in percentages do not represent the share of a total (100%) due to the type of question formulated in the survey of origin as means of data collection regarding import and export markets, in which one survey respondent could provide a multiple response in terms of countries selected, later processed as different items representing the proportion of the total number of respondents that provide such an answer and not the cross border' participation structure.

To address Directionality and Dynamism properties, data from **Table 8** are taken into the analytical framework as an input to build a map of the country's cross border ECommerce Profile assuming that data from the selected source refers to countries in which transactions are completed regardless the goods' flow pattern. As visible in **Diagram 10**, the country' Ecommerce profile emerges with its own shape, different from the one's resulting for South Africa. Data from Mexico's online money flows *direction* responds accordingly to the type of transaction executed:

1) Mexican sales to other countries (ECommerce export markets: USA, Canada, Spain), represented in the left side of **Table 8** and **Diagram 10**, are considered to be the money source or *origin of inbound online money flows*, creating

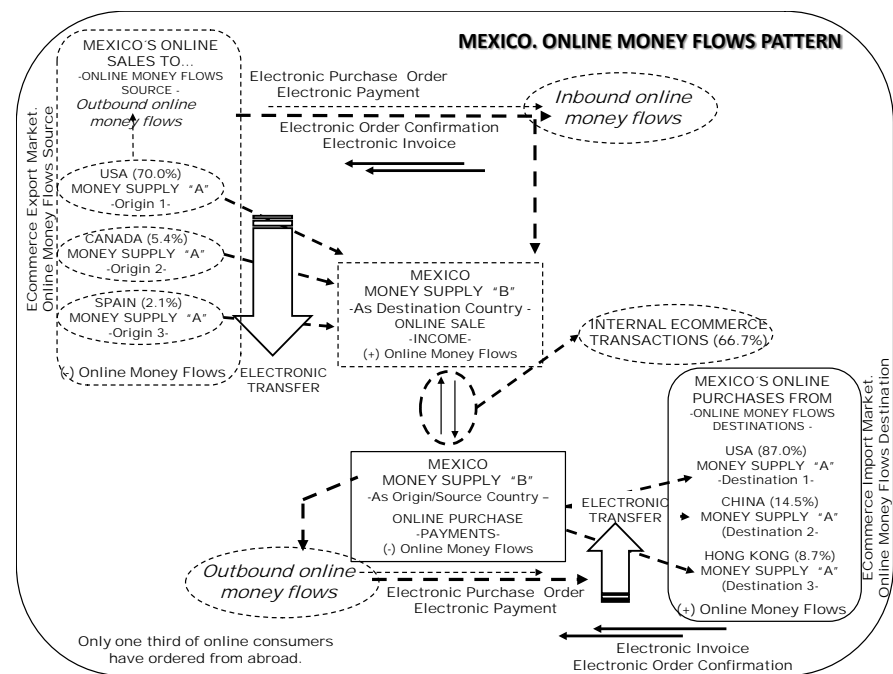


Diagram 10. Mapping a country's ECommerce operational profile. Selected Case: Mexico. Source: Elaborated upon data registered in **Table 5**.

Table 8. Mexico. Cross border ECommerce composition. 2015.

EXPORT MARKET -Sales to- Inbound Online Money Flows		IMPORT MARKET -Purchases from- Outbound Online Money Flows	
Money Source	<i>Money Source</i>	Money Destination	<i>Money Destination</i>
USA 70.0%	<i>USA 89.0%</i>	USA 87.0%	<i>USA 61%</i>
CANADA 5.4%	<i>China 14.5%</i>	CHINA 14.5%	<i>Asia 41%</i>
SPAIN 2.1%	<i>Hong Kong 8.7%</i>	HONG KONG 8.7%	<i>Latin America 13%</i>
			<i>Europe 9%</i>
			<i>Others 2%</i>
Source (1):	<i>Source (2):</i>	Source (1):	<i>Source (2):</i>
PAYPAPERS, 2015 :8	<i>AMIPCI, 2016 :12</i>	PAYPAPERS, 2015 :8	<i>AMIPCI, 2016 :12</i>

Source: Table elaborated upon the basis of data from: (1) Cross Border ECommerce Country Report PAYPAPERS, Mexico. 2014: 8 (2) *AMIPCI. Mexican Association of Internet. ECommerce Study 2015. Public Version: 12 Question Q2b. Q2b. ¿En que país o países se encontraban esas tiendas internacionales? (seleccione todos los que apliquen) In which country or countries were those international stores allocated? (Select all of those applying).*

a positive effect over Mexico's Money Supply, and a negative/reduction effect over each of the countries where the purchase is completed, in the example USA, Canada and Spain.

2) While Mexican purchases from other countries (ECommerce import markets USA, China, Hong Kong) represented at the right side are considered to be *outbound online money flows destinations*. In this context Mexican outbound online money flows are expected to produce a reduction effect over its Money Supply, generating on the contrary a positive effect over the USA, China and Hong Kong Money Supply amounts.

The observed data pattern suggests that changes in countries' Money Supply are expected as ECommerce transactions inbound and outbound *directionality* reacts to back and forth movements in ECommerce country's profile influenced by the type of transactions registered—purchase/sale—and/or by the number of participating countries engaged in activities registered in the left or in the right side of the map. The interpretation of the country's Map of cross border E-Commerce Profile provides elements to consider that, as formulated, Proposition 1 makes sense upon the light of the directionality property providing visibility to the composition of the country's cross border ECommerce transactions from which online money flows are created, providing the base of disaggregated data required to take the analysis into the field of the hypothesized relation between Online Money Flows and Money Supply.

The Map configuration presented in **Diagram 10**, makes observable online money flows Directionality Property, while the Dynamism Property is to be noticed through the pattern of the growth rate, as well as by the expansion over time to new countries, that leads to changes in the shape of the right side of the profile, not included in this map due to the moving configuration of the data series involved in such property. From the example based in Mexico's data, a first

comparison of cross border ECommerce value amount series to the country's Money Supply amount series suggests little—as in marginal—effect of online money flows on the total Money Stock. Nevertheless, it must be taken into consideration that these results correspond to a country with low/increasing value amount of ECommerce activities mainly derived from local-internal transactions, with cross border activities dominated by few countries, as identified by the available data released by national and international sources. These reasons support the notion that each country's profile is expected to be different as a result of the value amount size, rate of growth, dynamism and intensity of their correspondent ECommerce activities, producing then different effects of online money flows over their correspondent country's Money Supply.

Applying the framework' reasoning to the case in progress, upon the basis of The Paypapers data [92], **Diagram 10** shows Mexico's total ECommerce comprised by 66.7% of internal transactions and the remaining 33.3% by cross-border operations, reflecting a general internal adoption pattern, suggesting a potential internal market expansion in the matter. Focusing in cross-border operations, the number of partner countries reveals a profile in an opening stage of market activities either as exporter,—Mexico's inbound flows originated by exports to countries registered in the left—as an importer generating outbound flows to countries of destination registered in the right side of **Diagram 10**. ECommerce export activities identified in the left side shows as origin of online money flows to a market group configured by the USA (70.0%) and Canada (5.4%), which are fellow countries members of NAFTA with Mexico, and Spain that participates with 2.1% of the purchases reported. In the other direction, outbound online money flows move from Mexico to the USA (87%), China (14.5%) and Hong Kong (8.7%) as countries of destination, due to the ECommerce import transactions completed with each of them, producing an expected reduction effect over the import country's Money Supply.

Changes in countries' Money Supply are expected as ECommerce transactions inbound and outbound *directionality* changes reacting to changes in ECommerce country's profile influenced by changes in the type—purchase/sale—and/or in the number of participating countries engaged with Mexico in activities registered in the left or in the right side of the map. The interpretation of the country's Map of ECommerce Profile provide elements to consider that as formulated Proposition 1 makes sense upon the light of the Directionality property.

Moving forward in the application of the theoretical relations of the Proposition 3 referred to the Intensity Property to the Case development goes this far given that requires data series availability regarding cross border ECommerce number and frequency of transactions completed by the country—in both directions—organized by amount size, as a basis to identify growth rate patterns (atomized/concentrated transactions) creating data inputs to explore the hypothesized relation between the amount of Money Supply and the intensity of online money flows. So far available information produced is oriented to privi-

lege data creation about the type of products sold/purchased, labeled digital expense, customer's demographics, and other general market related indicators.

The reality of data absence is materializes when Proposition 4 is applied to the Case in progress as the following context reveals: a) Mexico's Money Supply data series are available from an international reliable source and, b) supported by annual surveys, estimated Mexico's ECommerce market value at the highest aggregated level (total) is integrated into data series by a local private organization becoming the available data source, mentioning as single cross border data that 57% of ECommerce *purchases* (from..) made correspond to international transactions, leaving unveiled and unmentioned any information about the *sales* (to..) component required to provide sense to an estimated data configuration regarding cross border ECommerce online money flows value. Even when available data series of Money Supply' total amount and growth rate meets Proposition 4 requirements, they represent a single construct playing as the half of the stated relation, being required disaggregated/granulated data from inbound (sales to) and outbound (purchases to) online money flows to explore the structural connection between the two constructs of interest. Under the described scenario—available data covering Monetary Theory observable measures vs. unavailable data covering Business Theory observable measures—, the interpretation of the particular effect is out of consideration in the present analysis, remaining Proposition 4 as a theoretical statement to take further on in future research.

8. Conclusions

Information Technology re-evolution is opening a new field for the Economic Theory heritage expansion by means of Digital Economy Theory formulation and further empirical validation. In the context of this paradigm shift, electronic or *online money flows* resulting from E-Commerce activities are considered to be an essential element of the Digital Economy by identifying its monetary component. This research process conducted to explore the nature of the relation between those Online Money Flows and Money Stock/Supply, shares this perspective intending to draw attention into the complex system world in which waves of technology influences are strong enough as to reach macroeconomic indicators, creating an expansion persistence after the original source has stopped identified as a reverberating effect. Immersion in the new field rise challenges for theory development endeavors often related to the selection and/or development along the process, of analytical tools supported by the solid multi-theoretical and operational frameworks required for such a purpose. Under this view, Digital Economy and equivalent terms seems to be far beyond the plain understanding of the introduction of Information Technology infrastructure to the Economy operations as an explanatory issue of the origin of a new economic phenomenon. Rooted in this reasoning is the idea that efforts for Digital Economy Theory building requires to identify the emergence of new components playing func-

tions in the Economy, as well as to move forward into a full understanding of the nature of any relation with elements of the existing economic theoretical body of knowledge.

Addressing the phenomenon of the effects of the emergent online money flows—transferred cross border by means of Electronic Transfer modes—on monetary structures such as country's Money Stock, a theory explaining the nature of the relation between these two key constructs is outlined. The heart of this theory is determined by the findings upon the characteristics/properties identified in the *nature* of the relation between the constructs, specifying as well how those constructs are to be observed in terms of measurable indicators. The characteristics of the relation expressed in the set of four propositions formulated for that end, connects in a relational net configuring a Theoretical body of knowledge, where new components are distinguished in the figure of four major characteristics identified as Directionality, Dynamism, Intensity and Structural Properties, each of them featuring specific remarks on the matter as is underlined by the Directionality Property explanation described in terms of the divergent paths regarding their country of origin/destination followed by E-Commerce goods physical flows and their correspondent online money flows, provoking a misplacement that challenges movements register either in a traditional Trade Balance Account as in national Census statistics. As a node in a relational net, Directionality Property provide the basis to build the Dynamism Property introducing... the notion that regardless the goods flow pattern, cross border ECommerce electronic money transfer is a process by which within M2, the component cash money in circulation (M1) is transformed into a new Quasi-Money component, making reasonable to expect that the combination of its growth and acceleration results in dynamic changes for Money Supply net value... This is a key finding, under the light of theoretical considerations, supporting the idea of the emergence of a new different component—online money flows—to be integrated into the Money Stock structure, under the Quasi-money category. The conjunction of these two properties turn to be Proposition 3 building blocks, oriented to identify how the Intensity of cross border ECommerce transactions volume reflects in the amount of their correspondent online flows value and in the velocity of money, extending the effect to the Money Stock amount of the countries engaged in the activity accordingly to the directionality and the dynamism properties of the relation under study.

The order of ideas established by the continuum of directionality-dynamism-intensity of cross border ECommerce online money flows influencing Money Supply as a new M2 Money Aggregate, give rise to a network that determine the complex Proposition 4 relational model, introduced as the Structural Property. This emergent relational net, shapes a theory in which recognizing online money flows as a technology derived component—a technology creature—connects with the Economy at macro level by means of its effects over Money Supply M2 Aggregate. The resultant key assumption is that online money flows being a M2

component, play as an operational link between the monetary component of digital/electronic commerce activities and the physical monetary structure of a country' economy and its related macroeconomic policies, being understood that the value of the e-monetary mass circulating as online money flows cannot be computed so far because it is on the conceptual level. This view leads to sustain the notion that being online money flows one new additional component of M2, they are absorbed by a country's Money Supply, thus challenging the idea of the presence of a new digital economy operating in parallel by itself, as another/ different economic structure.

The findings of this analysis, supports the notion of the emergence of specific components of the evolving economic paradigm such as the online monetary flows, the online Global e-Commerce markets operation span, the shadow e-Trade Balance operational displacement, the invisible effects over key tax issues, or the configuration of an intangible e-GDP not visualized so far as a disaggregated concept in country' GDP structural data composition. The influence of components of the kind extends to the configuration of new relations and balances between supply and demand forces—as in cross-border ECommerce transactions—bringing changes to traditional concepts of time, space and tangibility used by economic paradigms built as a reflex of physical and tangible operations that in early XXI Century are moving at an staggered dynamism or/and into quantum leap changes. Upon this basis, the emergent effects of Technology on macroeconomics features are detected as they connect each other's constructs into new theoretical formations. This view frames the analysis of Technology influences in an extended scenario of macroeconomic topics of the kind of Money Supply, employment, foreign trade, tax policy and economic growth [94], among others, as means to focus research efforts in pursuit of sustained explanations that could be useful in the design of mechanisms and tools such as Innovation and Technology Development Policy, Industrial and Trade Policy, Foreign Direct Investment, as well as Monetary Policy, to mention a few. In the sphere of influence of the Digital Economy this Technology Macroeconomic View Theory found its place as a building block of its developing theoretical body.

Results from this research shows that its stated purpose is covered concerning the *exploration* approach observed by the activities executed in terms of the collection, assessment, organization and analysis of key theoretical references, and available data to input the theory matching process of the selected abduction process, from which is drawn a system of four propositions, modeling a theory regarding the relational statements between the two main constructs. In the quest for an answer to the Research Question posed, an analytical framework is developed by first describing the conceptual network of the main constructs definitions as well as the classifications and representation of the data involved, followed by the description of the components' interaction presented in theoretical relational models as in operational descriptive models *of how theory works linking the theoretical components*. Being at the core of the Research Question

the identification of the *nature* of the relation between the two main constructs, the resulting set of four propositions is focused in the properties or characteristics of the relation, being each of them a node that gradually configures a relational network or system identified as an emergent theoretical body of knowledge that could be considered as a Technology Macroeconomic View Theory, useful as an explanation framework of Technology influences over the Economy. The selected innovative methodology process is completed presenting how the stated propositions works in the field of the phenomena interpretation, by means of a Case developed for such purpose.

The intriguing question underlying this research focus is... Does this relation matters? Recent reports offer data indicating huge advances in online payments acceptance as is interpreted from the reduction of online merchant's perception of online payments as a problematic area—from 25% in 2015 to 15% in 2016-, mentioning as the persistent barriers for acceptance the high transactions costs, the process of consumer identification and authentication, and the complicated check out process [95]. This growing acceptance is corroborated by the data analysis of this research revealing an unstoppable diffusion of ECommerce as business mode that mirrors the magnitude of the snow-ball growth of its correspondent online monetary flows expected to influence the Money Stock through a constant—active-growth rate of M2. Even when the effect of ECommerce online money flows over Money Stock is yet about to be noticed clearly, a striking evidence of the importance of this relation is provided by the USD 25.3 billion online sales reported, in a single day (11/11/17), by China's major ECommerce firm [96]. This bit of information, as well as the findings in the theoretical arena provide strong reasons to consider the relation between Online Money Flows and Money Supply as a paramount issue for technology and monetary policies attention.

Research Limitations

The level of analysis realized in this research results from the current status of the available data categorization as well as the multiple criteria applied by the sources for indicators on the matter. The full benefits of the use of the analytical framework developed in this research will come into view as factual data released are expressed in absolute numbers to provide sense to most of available E-Commerce data estimations commonly issued at present in relative numbers or based in different monetary units, perceptions, levels of disaggregation, taxonomies and/or segmentations by regions or groups of countries, which so far represents a limitation regardless the qualitative nature of the research study. Being the topic explored until recently, the research scenario is wide and especially rich producing for this reason constant appearance of related concepts with the resulting implication in the amount and scope of the reference list citations. The research agenda envisions a key venue of action, related to the further expansion of the Technology-Macroeconomic View to other fields of Economic

Policy such as Tax implications.

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