Cashless and *Cashy*: the Yin-Yang of Digital Delivery

Evidence from Agent Networks in Peru

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Introduction

- Large scale agent networks make **delivery easier** for financial service providers by eliminating the need to create their own infrastructure in order to reach wider geographies.
- For remote and lower income customers, these **more proximate agents are their points of access** to a richer portfolio of financial services at lower costs.
- New banking models (mobile banking, agent banking) that have high **potential for financial inclusion**, largely depend on the ability of these agents to provide extended coverage, including reaching rural areas.
- **Several factors** affect the possibility of this happening: the degree of service aggregation, the volume of cash-based services offered, the complexity of transactions, as well as operational cost structures.
- This study presents insights from **characterizing five agent networks** in Peru, with more than 26,000 agents in total. It presents some findings on how these factors impact the ability of networks to gain scale and coverage. The four main types of networks identified are: Bank-Centric, MNO-Centric, Provider-Agnostic and Transactional-Shop.

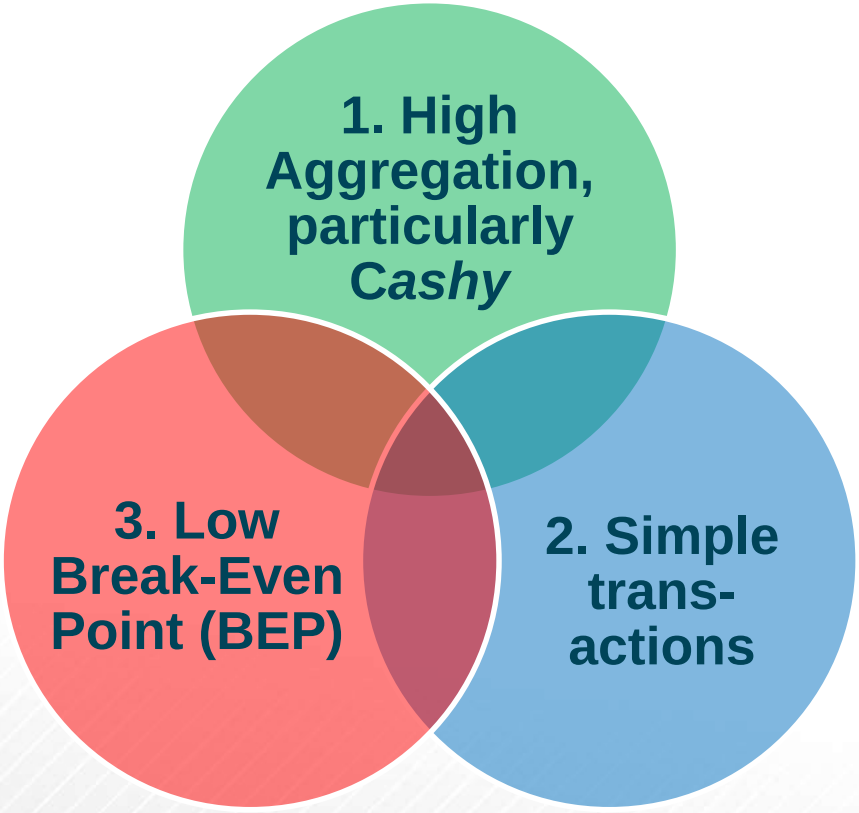
Key Messages from Peru

1. **Aggregation drives agent revenue:** the more services offered (bill payments, branchless banking, etc.) the larger the transactional pool that can be processed. Highly aggregated portfolios display up to 8x differentials in agent revenue.
2. ***Cashy* transactions are a fundamental factor contributing to the viability of agents.** In Peru, cash-based over the counter transactions (such as bill payments) represent a significantly large transaction pool, ranging from 40% to 90% of a network's total income.
3. **Simpler transactions display increased agent density per locality and network scale.** Complex transactions (such as some banking transactions) involve more expensive infrastructure and procedures, thus setting a higher bar for the number of agents that can reach the amount of transactions necessary to break-even.

Continued - Key Messages from Peru

4. Beyond simplicity, each **network's business model features**, such as liquidity management duties, affect also the operational cost structure and thus **agent's point of break-even (BEP)** in terms of amount of transactions. In Peru, low BEPs explain agent density and thus proximity both in rural and urban settings. Business models studied range from 3500 to 150 monthly transactions for BEP.
5. However, there are trade-offs and while simpler transactions provide lower break-even points and thus denser networks, their **financial inclusion potential is more limited**.
6. Overall, **the Peruvian *sweet spot* for network density, scale and thus access** is located, surprisingly from some perspectives, at the intersection of high aggregation of services, including *cashy* transactions, low break-even points and simple transactions.

The Peruvian *Sweet Spot*



The Peruvian *sweet spot* for scale and density in agent networks lies at the intersection of the three core market trends identified.

This rather counter-intuitive finding, has also some trade-offs, as will be explained in the following pages.

1. *Cashy* Aggregation

Service Aggregation is Predominant

- **Aggregation is a predominant strategy in Peru**. It is used to a different extent by the five agent networks studied.
  - At a marginal cost, the **Operators of the Agent Networks (OANs)** have strong incentives to aggregate multiple service providers in their platforms and thus increase their potential transactional pool, thus enabling more agents to reach their break-even point.
  - See Value Chain additional slides in Annex.
- Since **aggregation erodes competitive differentiation** for service providers, some models take an exclusive approach for certain categories of services. For example, a bank-centric network typically is exclusive to one bank and aggregates services for other providers, such as bill payments or airtime.
- Cash-based Over-The-Counter (OTC) transactions –i.e. *cashy* transactions– represent an essential source of revenue to sustain agent viability and ultimately, network density and scale, despite having a lower financial inclusion potential. ***Cashy* transactions represent from 40% to 90% of overall network revenue.** See slide 10.

Models by Portfolio, Exclusive vs. Aggregated Services

See Annex for more specific characterization of the different models

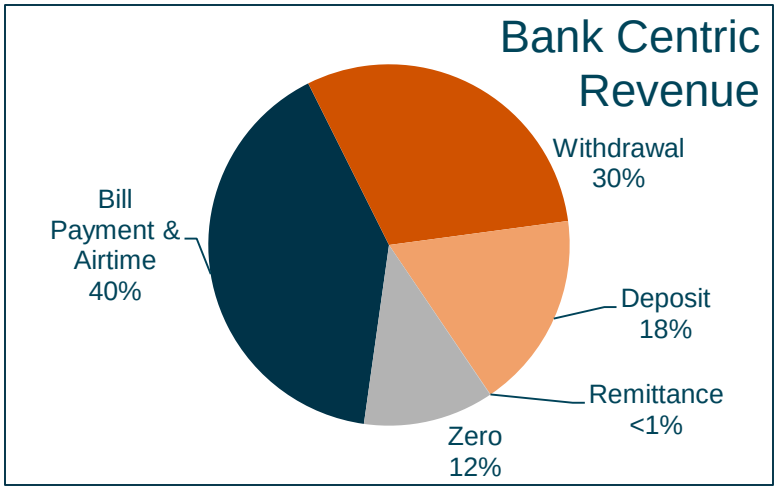
Some networks are "tiered", not all agents offer the complete portfolio

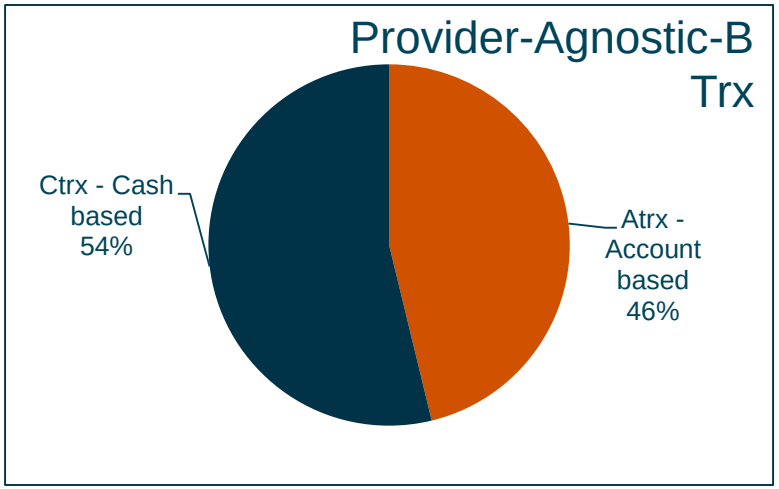
	Trx-Shop		Bank-Centric		Provider-Agnostic		MNO-Centric	
Agent revenue	34x		8x		3x		x	
	Exclusive	Aggregator	Exclusive	Aggregator	Exclusive	Aggregator	Exclusive	Aggregator
Branchless Banking		✓	✓			✓		
Airtime		✓		✓		✓	✓	
Bill Payments		✓		✓		✓		✓
Remittances		✓		✓		✓		

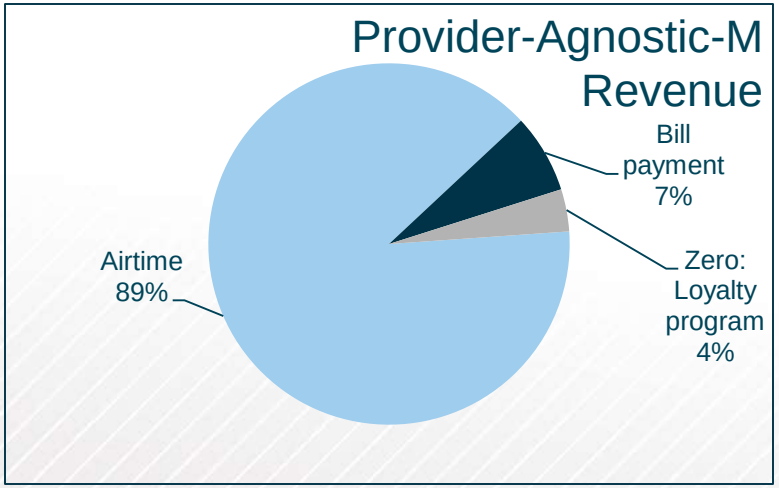
Indirectly through bank deposits

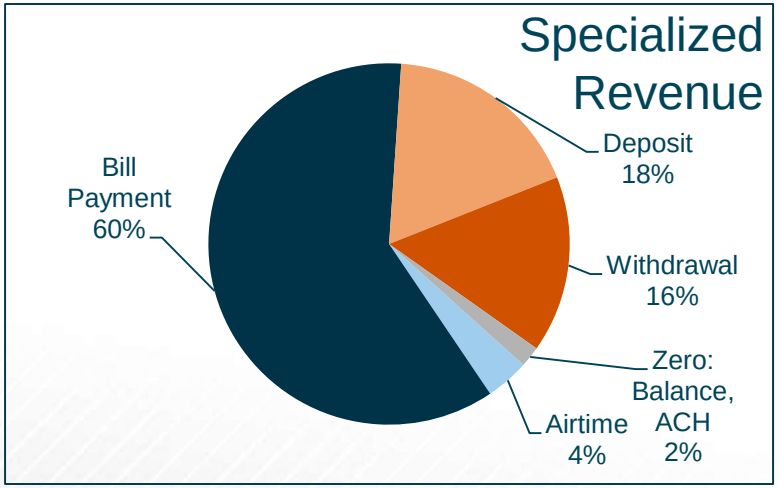
Cashy Transactions' Contribution

Per model, 2013.









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2. Simplicity

Simpler Transactions Display Increased Scale and Density

- In Peru, agent networks with **simpler transactions display increased agent density per locality**.
  - These networks aggregate service portfolios that have fewer process requirements, lower operational costs, thus increased agent density as abundant lower productivity agents are viable.
  - In contrast, agents whose operation involves paper receipts, identification procedures, higher value average transactions, and cash-out transactions see an increase operational costs. Higher break-even point reduces agent density.
- Informality is also an important issue, as more complex transactions **require formalized agents which are less abundant**, even more so in rural areas.
- Simpler transactions, which are usually *cashy* payments, have **lower financial inclusion potential** as savings or insurance products for example always is more challenging on the operational side.

Simplicity of Transactions, Network Density and BEP

Dec, 2013.

	Trx-Shop	Bank-Centric	PrAgnostic- B	PrAgnostic-M	MNO-Centric
Agent Monthly Trx for Break-Even, from OAN Perspective	3 500	1 150	350	350	150
Mature network density: Agents per 1000 district inhab.	0.01	0.32	0.14	1.11	4.00
Paper receipts	✓	✓	✓	Some	
Identification	✓	✓	✓	Some	
Larger transactions	✓	✓	✓		
Cash-out	✓	✓	✓		
Formal agents	✓	✓	✓	Some	

3. Low Break-Even Point

Lower Break-Even, Increased Scale and Density

- The Peruvian case also illustrates that the amount of transactions required by an agent to break-even (BEP) is fundamentally connected with agent density in a given locality, either rural or urban. **Networks with lower break-even points display increased agent density.**
- The operational cost structure of the Operators of the Agent Networks (OAN) explains such relation: networks with lower break-even points are **able to acquire lower productivity agents** which are more abundant.
- The operational cost structure is determined chiefly by how the business model of each network model manages five core cost components, which factor in the complexity element detailed before:
  - The more core components not assumed by the OAN, **either by discharging them on the agent or the service providers**, the lower the BEP will be from the network's perspective.
- **Overall, the study suggests that agent density and scale are determined by the average break-even point and by its potential transactional pool**. See slide 18.

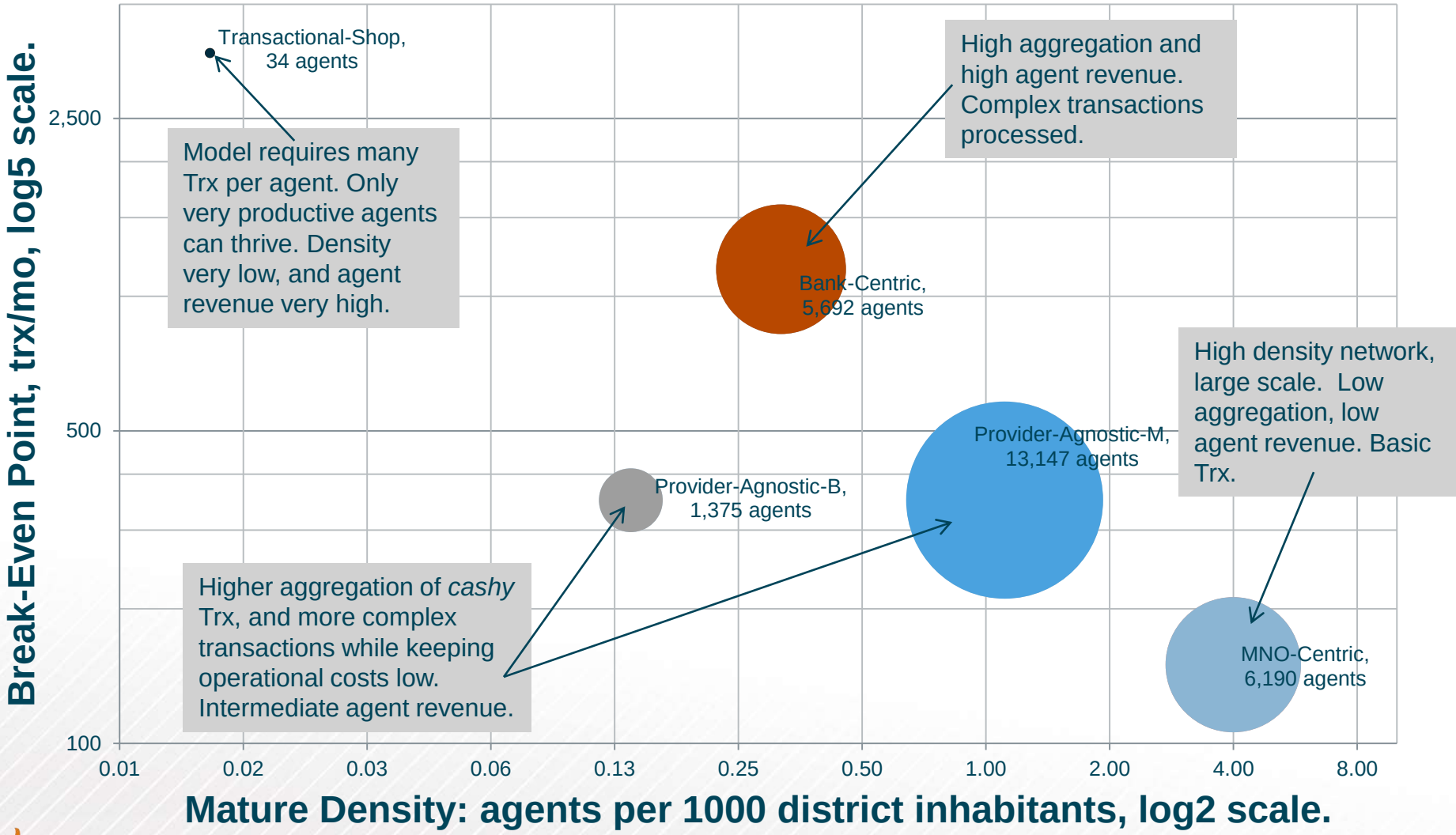
Characterization of Business Models and Cost Structure

	Trx-Shop	Bank-Centric	Prov-Agnostic	MNO-Centric
Agent Monthly Trx for BEP. OAN Perspective.	3 500	1 150	350	150
Are Trx the sole source of revenue for agent?	Specialized	Diversified	Diversified	Diversified
Provider of Working Capital	OAN	Agent	Agent	Agent
Provider of Hardware/ Connectivity	OAN	OAN	OAN	Agent
Responsible for Liquidity/ Replenishment	OAN	Agent	Agent	OAN or Agent
Provider of Labor and Space	OAN	Agent	Agent	Agent
Responsible for Fraud/Security/Risk	OAN	Agent	Agent	Agent

Insights beyond Peru

Map: Network Density, Scale and Simplicity. Can you have it all?

Dec 2013. See Annex for methodology and definitions



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Peru's Growth Path Story: Further into the *sweet spot*?

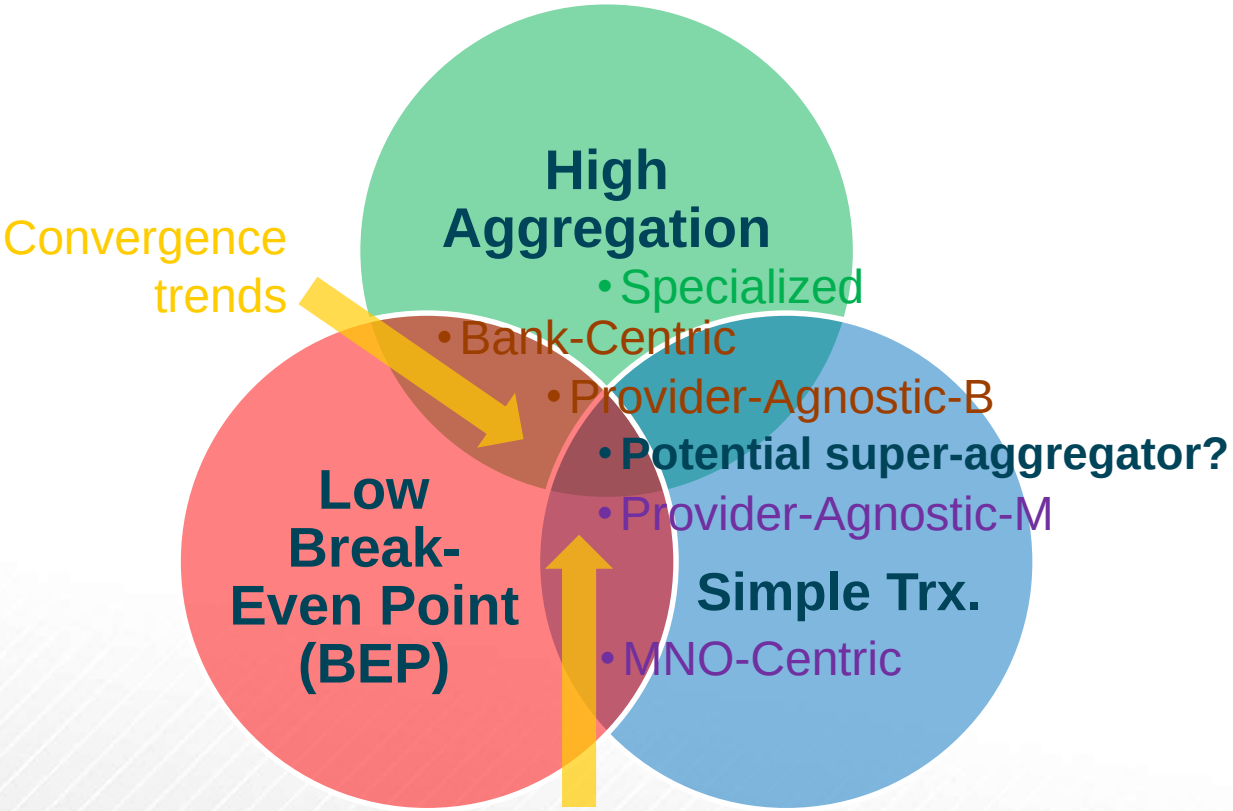
The Peruvian experience in the development of agent networks illustrates the following sequence:

1. **Critical mass, technology and two origins**: by mid 2000s, as mobiles began to be widely adopted, two kinds of service providers had transactions pools with a sufficient critical mass to make agents reach their break even point and thus become viable: banks with bill payments and MNOs with airtime top-ups. Either directly or through third parties, banks and MNOs started operating parallel agent networks. Both of these critical transactional pools were *cashy* (Ctrx).
2. **Aggregation and convergence of service portfolios:** Operators of agent networks began aggregating services leveraging the possibility to do so at marginal costs, increasing returns. This aggregation process is making agent networks with different origins (airtime, Provider-Agnostic-M vs. bill payments, Provider-Agnostic-B) converge towards similar service portfolios. As of 2013, for example, the 5 models surveyed process some form of bill payments.

Continued - Peru's Growth Path Story: Further into the *sweet spot?*

3. **Competition across agent networks:** This ongoing convergence process shifts the competition for the acquisition of agents away from product differentiation (a strategy more feasible for a few leading banks for example) and more towards operational efficiency and large transactional pools. From a financial inclusion perspective, the Provider-Agnostic OAN models, get the spotlight as they are providing an intermediate position between agent availability and the processing of more complex transactions with financial inclusion potential.

The Peruvian *Sweet Spot* revisited



The convergence trends identified raise the question about how efficient aggregators can become in order to process transactions with more financial inclusion potential while keeping BEPs low.

Implications for the financial inclusion debate in other markets

- **Rural coverage:** aggregation, especially of *cashy* transactional pools, together with simplicity in order to keep operational break-even points low, are key elements for viable agents in rural areas.
- **Regulation:** optimal balance between simplicity and operational requirements for banking services offered through agents, would increase scale and density of the networks both in urban and rural settings.
- **Product design:** design decisions are fundamental in shaping processes and requirements, and ultimately, agent density.
- **Deployment strategy:** driving usage of *cashless* account-based services needs to go hand in hand with *cashy* transactions. The latter enables higher agent density which is critical for adoption of the former.
- **Exclusivity:** while offering exclusivity to specific agent networks is sometimes a powerful competitive differentiator, it can constrain agent density and ultimately access, a key attribute of the value proposition customers.

Continued - Implications for the financial inclusion debate…

- **Interoperability:** aggregation from third party agent networks can be an easier alternative to interoperability as it enables over the counter transactions between platforms but it that does not require interconnection at the service provider level.
- **Model potential:** even mature agent networks are likely to benefit by further aggregating large payout flows, such as Government to Person payments (G2P), payroll services, among others.
- **Tiered agents:** both for operational and regulatory purposes the idea of establishing tiers of agent, which is already being implemented by some operators, can be useful to enable network density and scale across distinct geographical areas.

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Annex

Framework, methodology and further details.

Model Benchmark

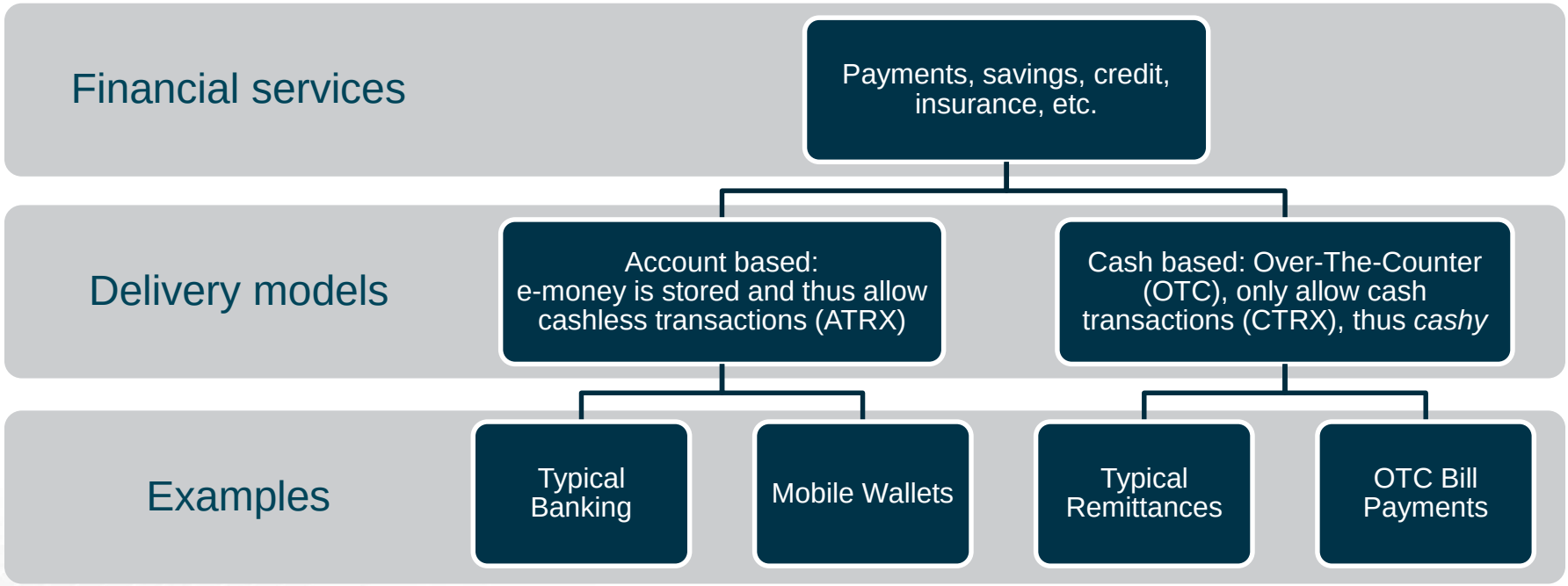
*Dec 2013, selected variables. Estimates are marked with **

Model Benchmark		Trx-Shop	Bank-Centric	MNO-Centric	ProvAgnostic-B	ProvAgnostic-M
1.1	POAs	34	5,692	6,190	1,375	13,147
1.2	Inhabitants in area of operation	5,713,518	22,575,750	1,778,336	20,472,774	23,000,000*
1.3	Urban agents (vs. Rural)	100%	91%	91%	85%	90%
1.4	Mature agent density (POAs per 1000 district Inhab.)	0.01	0.32	4.00	0.14	1.11
1.5	Mature agent density (Inhab. Per POA)	77,150	3,150	250	7,300	900
1.6	Mature agent density Urban (Inhab. Per POA)	77,150	2,900	200	10,200	850
1.7	Mature agent density Rural (Inhab. Per POA)	#N/A	3,400	300	4,250	2,550
1.8	Terminal type: mobile, POS, PC	POS, PC	POS	PC, Mobile	POS	POS, PC, Mobile
1.9	Years of operations	4	8	4	6	9
1.10	Transacted volume, monthy average 2013 (USD)	$9,952,675	$508,197,448	$4,919,095	$24,750,000*	$20,719,916
1.11	Transactions, monthly average 2013	192,899	14,896,960	2,310,305	825,000*	6,051,005
1.12	Transactions per agent, monthly average 2013	5,674	2,617	373	600*	460
1.13	Transaction value, average 2013 (USD)	$51.60	$34.11	$2.13	$30.00*	$3.42
1.14	Agent revenue, monthly average 2013 (USD)	$1,176.59	$291.67	$35.76	$158.00*	$42.94
1.15	Agent break-even monthly transactions – BEP	3,500	1,150	150	350*	350
1.16	Transactions CAGR 2011-13	23.2%	22.7%	25.1%	95.1%	25.13%
1.17	Churn rate, 2013	0.5%	17.7%	3.0%	1.8%	3%
1.18	Agent distribution per Trx q (Top 20% POAs/Bottom 20% POAs)	4.76	9.22	20.60	#N/A	#N/A

Agent Network Models Characterization

- **Bank-Centric:** networks aggregate bill payments and airtime. They keep banking services exclusive to own bank. Lower informality of agents.
- **MNO-Centric:** networks aggregate bill payments, but keep airtime exclusive to own MNO. Higher informality of agents.
- **Transactional-Shop:** networks aggregate indiscriminately, though they differ significantly in the fact that that these agents have transactions as their sole source of revenue; they are specialized in the transactional business.
- **Provider-Agnostic:** networks aggregate services indiscriminately. Sub-types B and M are referenced when differences are meaningful. Letters B and M identify their origin or growth path as presented in slides 19/20 (Banking/Bill Payments or Mobile). B has much lower informality and its service portfolio is homogenous among access points, not tiered.

Framework, Categories of Analysis



Framework, Value Chain

Three link-levels in the agent networks' value chain:

1. **Service Provider (SP):**
   Offers services to customers who interact through the agent network's points of access, mostly through cash-in and cash-out services. Service providers can be banks, telecommunications companies, public utilities, or remittances companies, among others.
2. **Operator of the Agent Network (OAN):**
   Runs a cash collection service that enables cash-in and sometimes cash-out services on behalf of the SPs in large number of agents. The OAN also acquires these agents. In some cases OANs also run a technological platform that enables the customers to interact with the SPs at the points of access, often in real-time. When the technological platform is run by the OAN aggregation of multiple SPs increases revenue at marginal costs.
3. **Agents or Points of Access (POAs):**
   Physical stores that process mostly cash transactions on behalf of SPs, and manage this cash according to OAN rules. To perform these transactions POAs use connected terminals such as PCs, mobile phones or other POS specific devices, which are usually provided by the OANs.

Framework, Transaction types

- Transaction types for agents (see definitions in following slide):
  - ATRX: Account based Transactions
  - CTRX: Cash based Transactions

- Transaction classification:
  1. Airtime: CTRX
  2. Bill payments: CTRX
  3. Remittances: CTRX
  4. Deposits: ATRX
  5. Withdrawals: ATRX
  6. Zero, do not affect liquidity (Transfers, balance inquiry, etc.): ATRX

Basic Glossary and Definitions

- **Account-based transactions, ATRX:** transactions made over the counter aimed at managing e-money stored in an account, such as cash-in or cash-out, and thus enabling also cashless transactions.
- **Mature network density:** number of agents per 1000 district inhabitants. Maturity is defined as a cap on the 20th percentile of the distribution of agents in order to conservatively exclude outliers. See specific slide in annex for further details.
- **Cash based transactions, CTRX:** transactions can only be performed using cash over the counter, thus *cashy.* There is no possibility of storing e-money for later use.
- **Agent Break-Even Point, BEP:** the quantity of monthly transactions that an agent must process in order not to run at a loss from the OAN perspective.

Methodology, scope and comparability

- Qualitative model characterization from detailed quantitative operational data provided by five agent networks.
- Unstructured interviews with network managers.
- Only transactional revenue is considered, financial revenues of OANs are not taken into account.
- Secondary transactional market is not included, where OANs interconnect their SPs with other OANs through their own platforms.
- The methodology and indicators have been designed to be replicable across regions and continents.
- Rural districts are defined as districts bearing less than 24900 inhabitants. Less than 5 districts over +1800 were arbitrarily tagged as urban given their metropolitan location..

Outlier treatment for mature network density at district level

Outlier detection and treatment
by Jacobo Menajovsky

"In statistics, an outlier is an observation point that is distant from other observations. An outlier may be due to variability in the measurement or it may indicate experimental error; the latter are sometimes excluded from the data set."

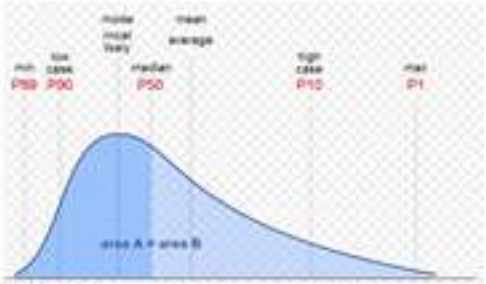
Often in banking and finance is common to have asymmetric distributions, and that has an effect on how you treat potential outliers.

Most -if not all- statistical approaches to outlier detection and treatment are based on central tendency measures like distance from the median, interquartile ranges, standard deviations, etc.

In this case, we are dealing with highly positive skewed distributions which compromise any statistical treatment of outliers. Actually those outliers adds a lot of information and not noise to our analysis.

But since we want to compare metrics across models and we are particularly interested in the lower end of the distribution tail (minimum POAs size as a proxy for break even) I finally came up with an idea on how to "treat these outliers" in our dataset; and this is by setting a cap on the 20th percentile of the distribution.

Pros: its conservative enough to include a larger set of POAs per model while still showing significant differences across them.
Cons: Subjective.



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