Block Transfer

Capital markets are supposed to facilitate the efficient formation of capital to support the expansion and growth of business and the creation of employment and prosperity for all of society.

But these days the exchanges are all for-profit businesses, and they all seem to be beholden to their best customers... who have the least to do with the purpose for which markets actually exist in the first place.

— Erik Townsend

Abstract

What if you didn't have to wait days for trades to clear, pay exorbitant hidden fees to your broker, or worry about holding counterfeit stock?[20][5][1]. Capital markets work, but they're incredibly inefficient. A few powerful institutions:

- control stock lending and margin, generating fake shares en mass;[1]
- systematically disenfranchise global investors from buying stocks; [2, 7] and
- through manipulative systems, ultimately cost investors over $3.75T/year.[2]

Transfer agents can uproot industry behemoths by undermining their grasp on capital markets. In particular, all brokers are commingled as but a single investor on the books of public companies. Public firms hire a "transfer agent" to maintain these investor records.

The stock transfer agent industry has consolidated to four major providers over the past few decades. Service amongst them has dwindled while prices skyrocket. Issuers are not satisfied.

Old transfer agents force book-entry stockholders to print complex paperwork, travel to an approved bank, present identification documents, wait for a tedious banker review, snail mail everything, and hope for an unhurried account statement or check back.[3]

We think significantly more investors would use transfer agents if their trading experience was digital, streamlined, and came with easy bank connections. This is possible since private stock sales on your own behalf aren't regulated as stringently as traditional capital markets.

Transfer agents haven't offered a trading interface because old market technology required centralized coordination. Securities laws disallow transfer agents from this. But decentralized ledgers and particularly the Stellar Decentralized Exchange ("SDEX") let book-entry investors match trades from anywhere with zero middlemen. This is the future of investing.

[1] How can stocks reach their full market value with mass sales of non-existent shares? See Page 1.

[2] We estimate these hidden fees cost the average stock investor 0.5%/year ($600k after $1k/month/40 years in indexes).

[3] This uses a "medallion signature guarantee stamp." Most impoverished investors abroad can't access authorizing banks for this special certification, and online alternatives cost months of savings. Finance should be open to everyone. Investing should be simple no matter where you were born.

1 Problem: We broke stocks

- In 2013, Dole Foods went private for $1.2B. The company only had 37M shares outstanding, but brokerage investors held 49M shares—12M extra. A third of the company's investors didn't get paid. [12, 13]
- Similarly, two investors bought nearly 1.5M shares of Global Links Corporation through their brokers, despite the company issuing under 1.2M shares. [3, 8]
- More recently, one in twenty GameStop shares trading did not exist on the company's capital books. [18]
- In another case, a fifth of Overstock.com shares trading did not truly exist. [15, 17]
- The problem is so big that the leading transfer agent organization suspects more shares voted than exist in over three-quarters of annual meetings. [14]
- In an election at Taser International, brokerage investors cast 82M votes despite only 61M shares existing. [16]

When we assign all our trust to a few central bookkeepers, we grant them the power to decree data transparency, investor accessibility, and arbitrary economic rents.

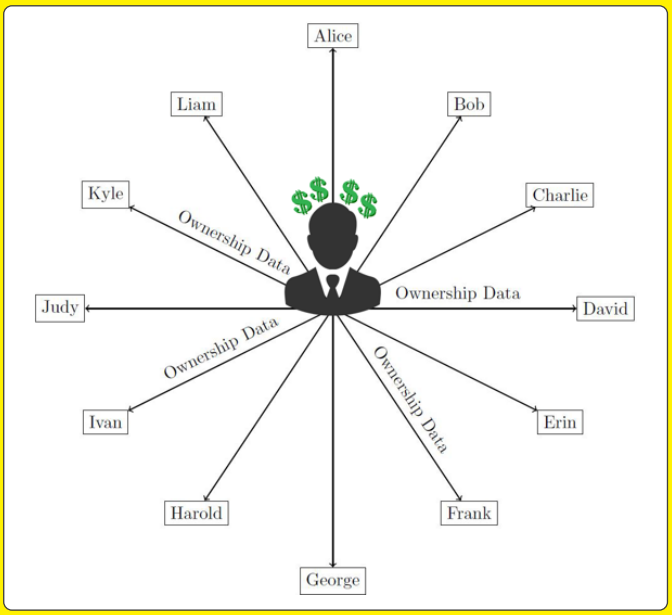

Fig. 1: Centralized Bookkeeping

Today, centralized transfer agents slow us down with mountains of paperwork. The nature of their centralized systems require high fixed compatibility costs and human interaction, which often means snail mail and phone calls. But, with a slight change, we think transfer agents are the future of capital markets. We're redesigning capital markets *without* centralized middlemen to eliminate:

- 3.75T/yr in hidden fees to investors,
- profiteering from artificial shares, and
- unequal access to investments abroad.

2 Background information

Block Transfer is currently implementing its transfer agent technology with its first private company client. We aim to revolutionize the way investors trade. We're tired of:

- the true costs of slow, opaque markets with hefty hidden spreads,
- unequal access to capital markets and commission-free investments, and
- drastically unequal returns on capital due to centralized asset managers.

This Yellowpaper details how to use:

1. digital assets *as* a transfer agent's authoritative master securityholder file,
2. cryptographic signatures in place of medallion signature guarantees, and

3. digital text memos for censorship-free, trackable distributed proxy voting.

Implementation in our original patent application.

3 Solution: Use digital assets *as* corporate stock ledgers

Old transfer agents use paperwork and centralized databases for stock ledgers, which means manual data manipulation for every transfer. But people aren't very reliable when it comes to extremely repetitive math or nuanced numerical systems.

Unfortunately, the industry is rife with agents making simple arithmetic errors despite one prevalent software suite provider. Moreover, slow response times from overworked agent representatives can frustrate issuers and investors alike.

Regulation gives agents three days to respond to "routine" transfers, meaning you already spent three days getting a medallion stamp. From the moment all your paperwork lands in their mailbox, an agent can sit on their hands for days until they get around to updating their ledger. It's even worse if you try to transfer "non-routine" restricted shares.

Fig. 2: A Medallion Stamp

3.1 Automation

New cryptographic technology lets us use proven mathematics instead of paperwork and trusted central processors. Namely, distributed public ledgers enable global investing by giving everyone the same *digital* trading rules.[4]

These new systems can drastically boost investor protection, voting transparency, and market confidence by eliminating hidden back-office errors and processing time. In particular, Stellar ledgers close about every five seconds. Marginally slowing down trading into SDEX batches curtails riskless arbitrage opportunities, enhances investor liquidity, and curbs market volatility. [4, 6, 9]

3.1.1 General overview

Distributed ledgers let us keep track of investor balances using time-tested algorithms that execute in seconds, 24/7/365.[5]

Instead of manipulating Excel spreadsheets, digital assets use programmatic "atomic execution." That means trades take full and immediate effect, or they fail. No waiting for mail. No hard-copy documents. No mystery counterparty delivering shares a week later. Just digital signatures.[6]

3.1.2 Trust in math, not middlemen

Fig. 3: Distributed Bookkeeping

[4] Using "trade" for when an investor transfers shares in exchange for a simultaneous transfer of dollars.
[5] In particular, we'll discuss our implementation using the Stellar network, which is about a decade old.
[6] Namely, users sign transactions with elliptic-curve cryptography which effect when distributed to peers.

To join the network, investors just privately associate their identity with a cryptographic public key. In practice, investors complete standard identity verification onboarding and generate a Stellar keypair.[7]

Once we confirm investor identities, we map them to the given public keys. These public addresses identify investors both internally for compliance and on the Stellar distributed ledger. Namely, we only approve requests to hold digital assets from good-standing requestor accounts.

3.2 Ledger balances *as* capital books

We can send investors initial shares from an old transfer agent or legacy broker, entirely on Stellar. Once stock assets land in an investor account, they're free to privately trade with other verified accounts.

That means we no longer reference the Excel spreadsheet from an old agent for reporting, voting, or dividends. Rather, we can now query balances, trade data, and historic votes via the perpetual, immutable decentralized network in real time.

From the investor's point of view, everything looks like a normal cash account with account balances, positional PNL, and instant settlement.[8][9] But behind the scenes, investors are protected against hidden share lending, trade internalization, and predatory order routing.

Most importantly, all this ownership data stays on the distributed ledger, existing as the public company's master securityholder file. That means issuers never have to coordinate with middlemen to query investor trends, statistics, or vote responses.

3.2.1 Impact

Since anyone can instantaneously create a blockchain wallet, cryptographic signatures satisfy the SEC's nondiscriminatory transfer requirements. We'd even venture to say that pressing a few buttons on a phone is significantly more equitable than waiting half a day at the bank with two IDs, especially abroad.

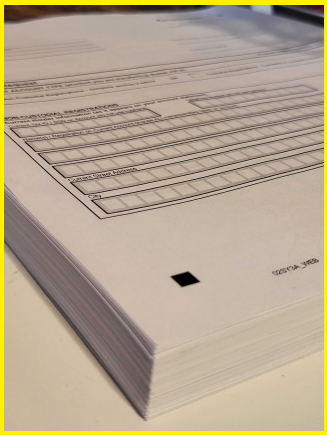

Fig. 4: Average Book-Entry Trade Paperwork

Thus, investors not only get their assets instantaneously, but companies also open up their shares to billions traditionally disenfranchised from direct equity investing. That's a big deal for growth-seeking investors abroad waiting to compliantly stash their cash in quality stocks without mountains of paperwork and fees.

3.3 Proxy voting through memos

No transfer agent has yet tallied investor votes transparently. Rather, quite the opposite is commonplace. Intermediaries count proxy cards behind closed doors, allocate broker votes arbitrarily, and discard unsatisfactory votes without notice. [10, 11]

We propose an alternative to mailing proxy cards with secret "control number" codes for a black-box voting machine.

3.3.1 General process

Once voting opens up, we send investors standard proxy notices. But investors use our wallet app to vote instead of dialing a call center or mailing back a postcard.

In the background, we set up a voting address like "demo*proxyvote.io." Then, in the

[7] Since investors never share their private keys, only they can digitally sign transfers through a wallet.
[8] Gain or loss derived from SDEX fill prices or legacy cost basis communicated in distribution memo.
[9] Investors exit trades by referencing a specific basis tax lot in the memo of a closing private trade.

app, investors select the company they want to vote for once reading proxy materials. They go through an interface with the voting items, selecting 'for,' 'against,' 'abstain,' or 'withhold' for each item, which gets mapped to a memo. If an investor voted for the first four director elections and against the next two propositions, their memo would be "YYYYNN." Then, they just send 0.0000001 XLM to the voting address with this memo, receiving instantaneous confirmation.

At the meeting, you can simply reconcile vote results from public voting addresses with record-date shareholder balances. Anyone can tally up public transaction memos to verify final counts, and all votes have the same cryptographic security as transfers.

4 Conclusion

This Yellowpaper presented three major innovations we use to implement controllable electronic stock records on the Stellar distributed ledger. If you're a public company, we can take care of the whole process for you in just a few steps while handling ongoing investor support and SEC compliance. If you're an investor, we hope to serve your account well.

4.1 We shouldn't exclude six billion people from investing

Investors should trade directly through a registered transfer agent rather than the outdated brokerage industry.

Brokers are innately very expensive. Put briefly, if you want to operate a broker, you have to pay for trading and holding broker-dealer registrations, internalization infrastructure, market depository fees, trading data fees, order-routing commitment contracts, clearing agency membership, daily settlement deposit expenses, trade matching documentation, internal controls and audits for fairness, and tons of other costs associated with trusted central order matching.

Subsequently, it makes sense that most brokers don't want to serve low-value investors abroad. It's just too costly. But when you transact directly on the books of a public company, you avoid all these operational costs (plus the hidden trading fees ultimately passed on to investors). By replacing an outdated reliance on medallion stamps with modern cryptography, we open investing to anyone, anywhere, anytime.

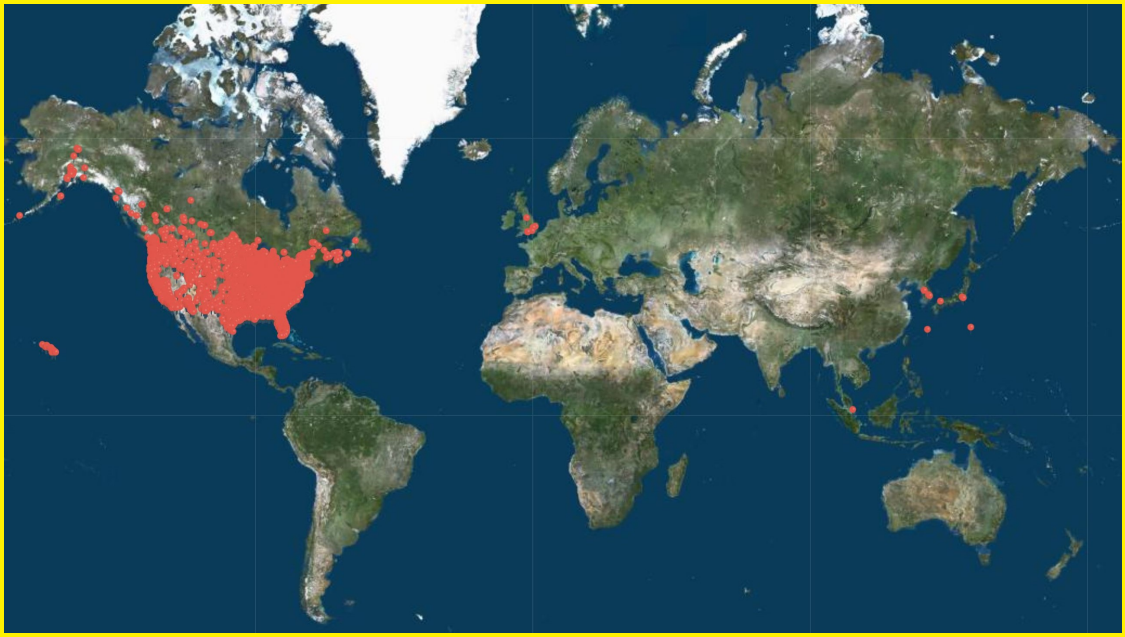

Fig. 5: Medallion Signature Guarantee Participants [19]

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A How transfer agents undermine the big banks, brokers, and HFTs

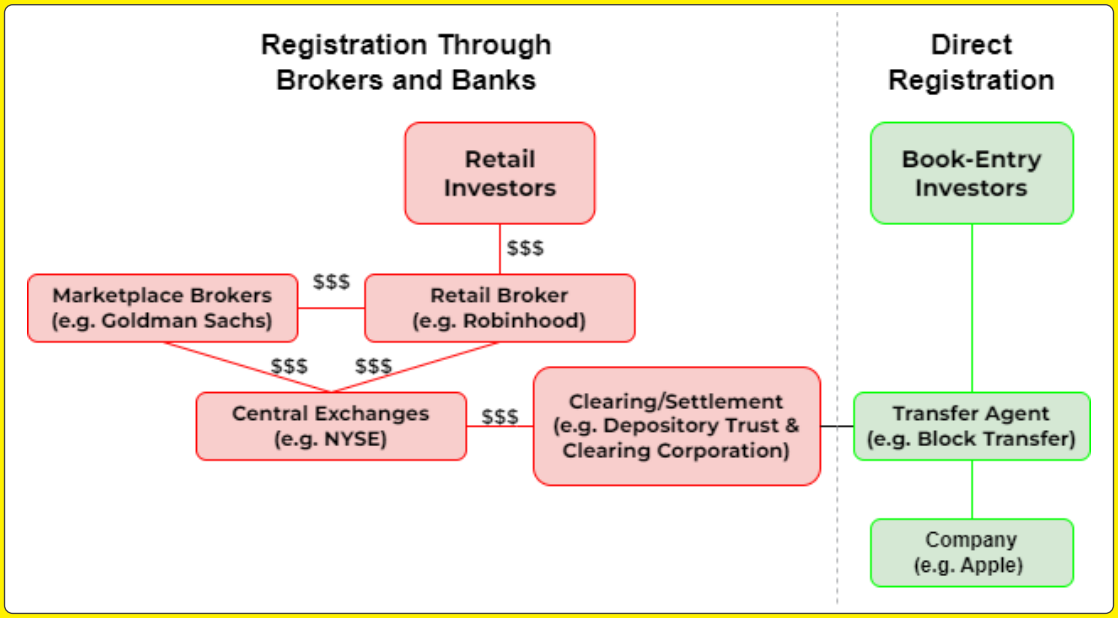
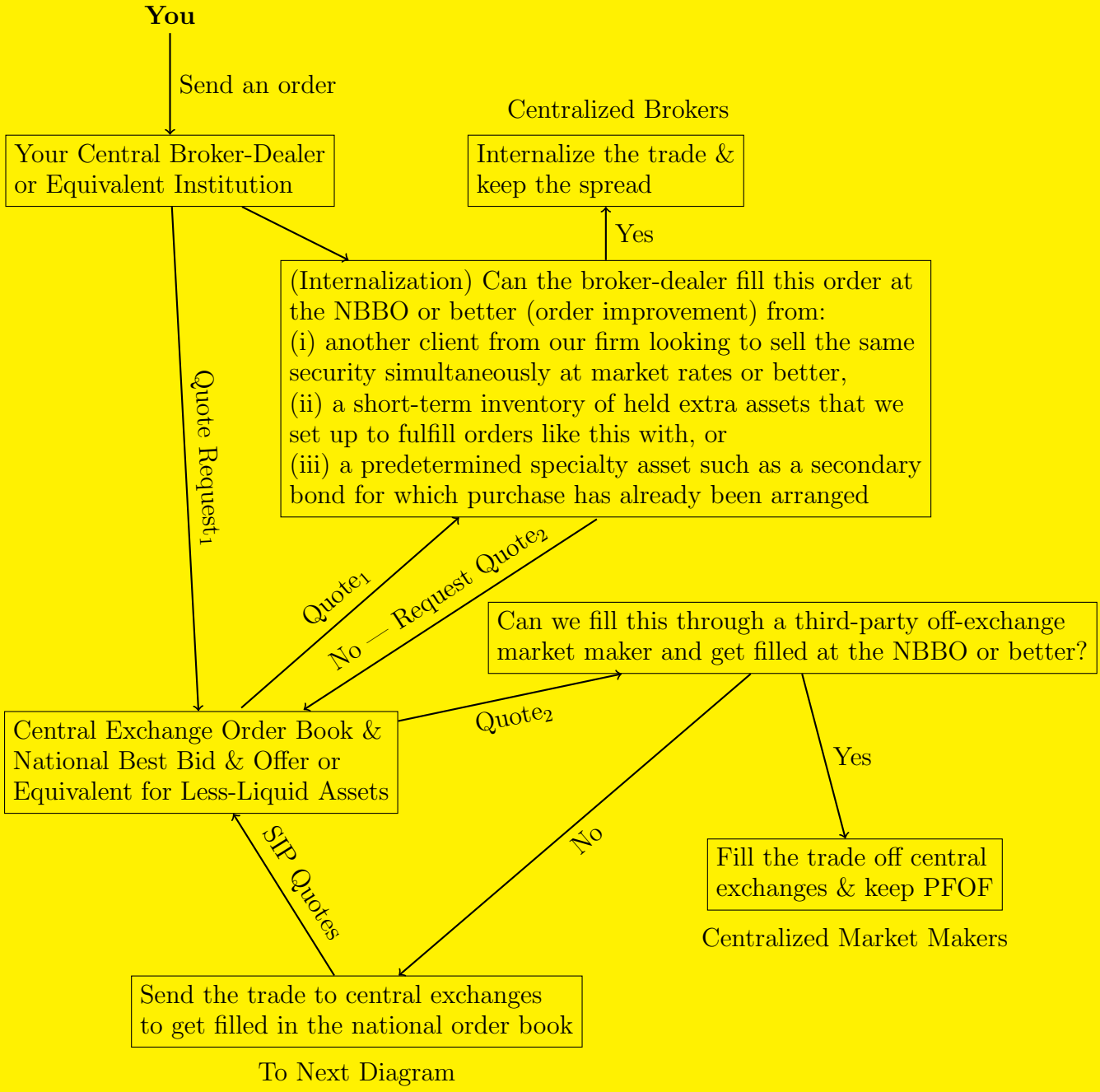


Fig. 6: Simplified View of Appendix B

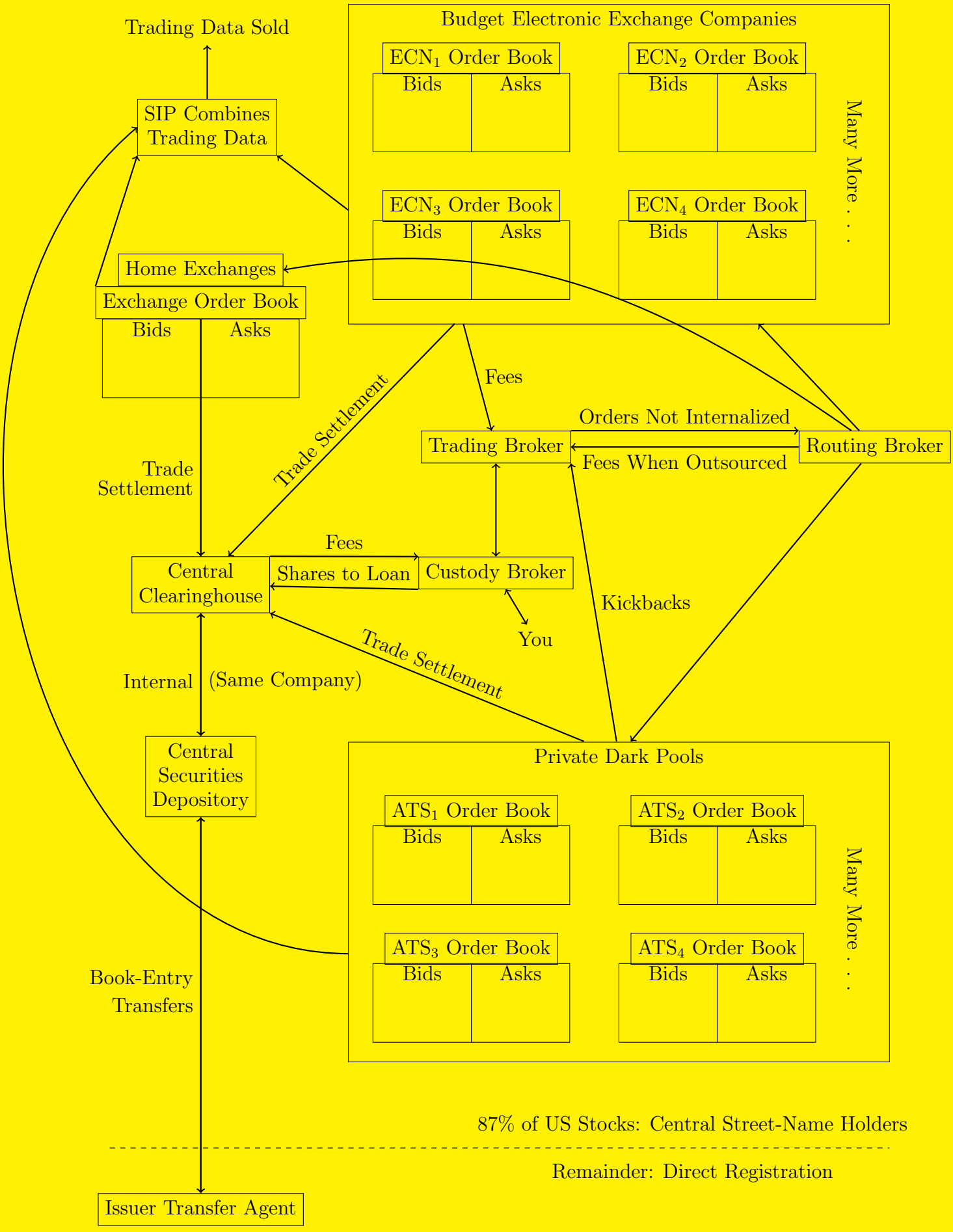
B Where transfer agents fit in trade clearing and settlement

Acronyms

- **National Best Bid and Offer (NBBO):** The highest bid and lowest ask limit order unfilled for a stock according to merged data from national securities exchanges.
- **Payment for Order Flow (PFOF):** Payment from a central third-party market maker to a broker-dealer in exchange for unfulfilled trades. Once order flow is sold, the buying firm must fulfill the trade at *any* price within the NBBO range for the last one second.[10][11]



[10] Top market makers trade in under 120 nanoseconds, enabling riskless arbitrage against your orders.
[11] Kickbacks from market makers are disclosed in brokers' quarterly 606 disclosures.


Trading Data Sold
Budget Electronic Exchange Companies
ECN1 Order Book
Bids
Asks
ECN2 Order Book
Bids
Asks
Many More . . .
SIP Combines Trading Data
ECN3 Order Book
Bids
Asks
ECN4 Order Book
Bids
Asks
Home Exchanges
Exchange Order Book
Bids
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Fees
Trade Settlement
Orders Not Internalized
Trading Broker
Routing Broker
Fees When Outsourced
Trade Settlement
Fees
Central Clearinghouse
Shares to Loan
Custody Broker
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Bids
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Book-Entry Transfers
87% of US Stocks: Central Street-Name Holders
Remainder: Direct Registration
Issuer Transfer Agent

C A pyramid of middlemen built on the backs of investors

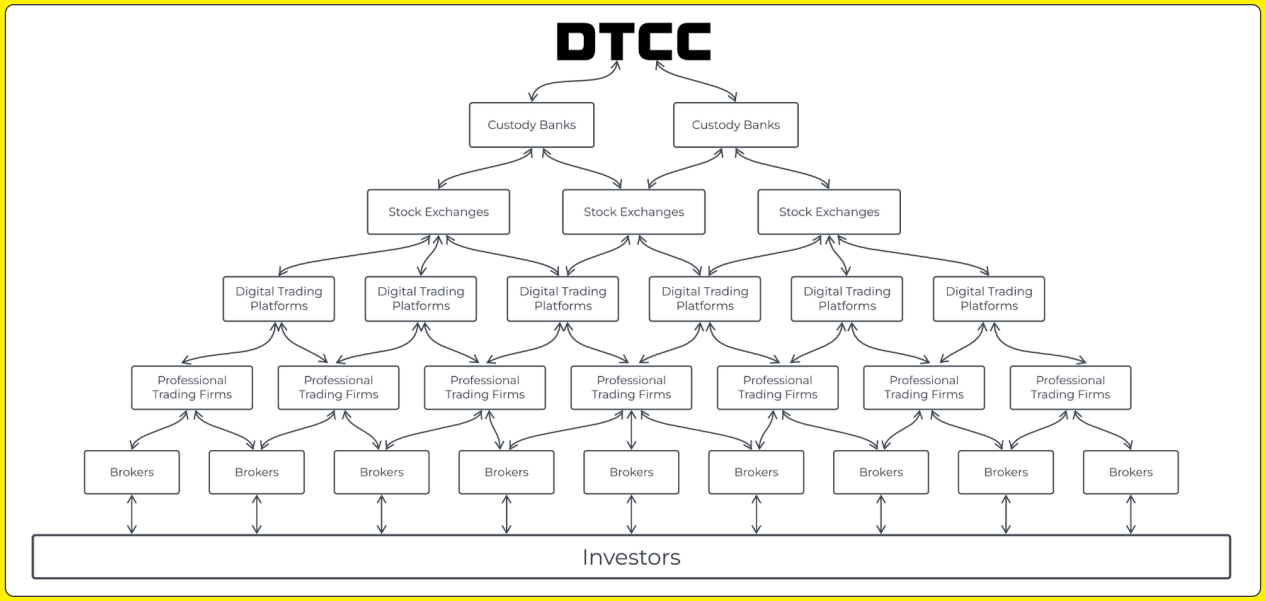

Fig. 7: Expanded View of Appendix A

D Ownership reconciliation shouldn't be this complex

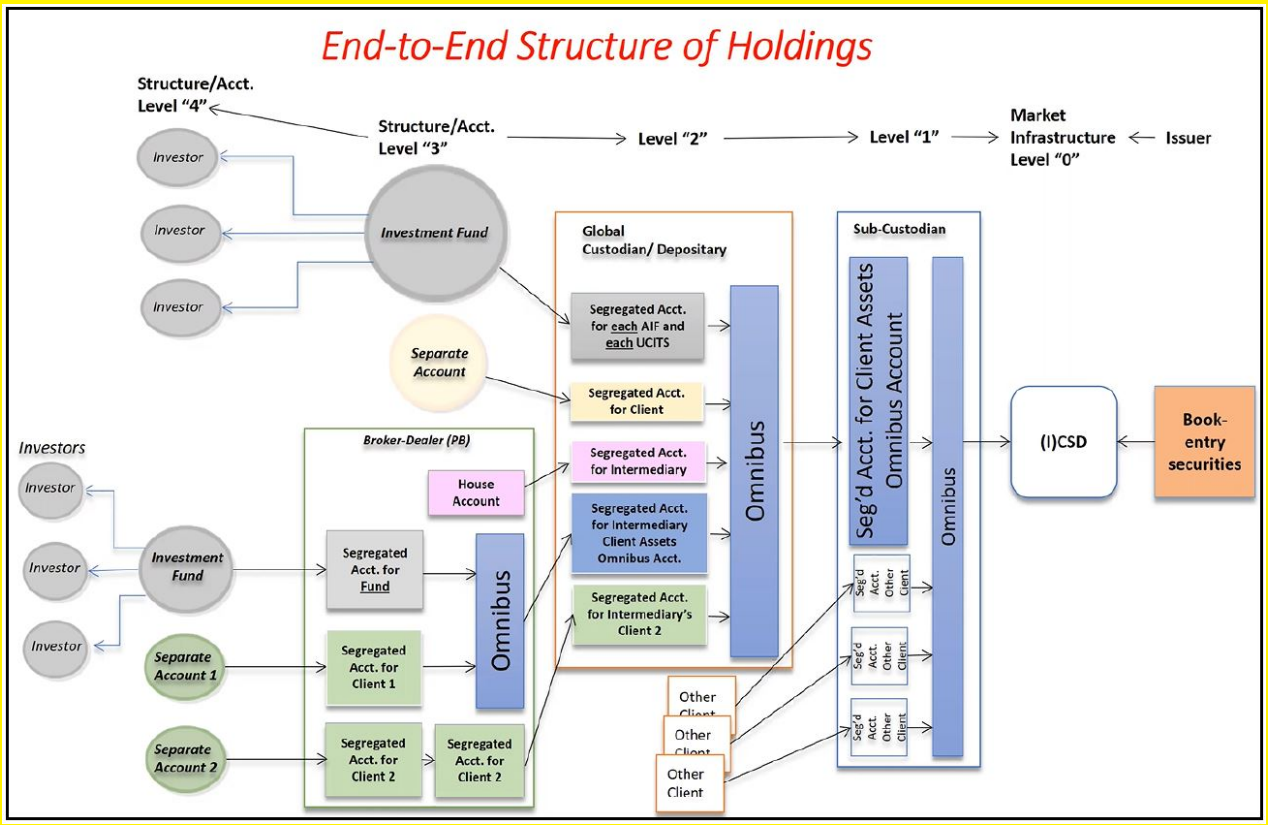

Fig. 8: Expanded View of Appendix C[20]