



VALHALLA NETWORK

Whitepaper V2.0

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Abstract

"We can decentralise power in our monetary system by abandoning the big banks and instead creating and supporting local not-for-profit community banks..."

Richard A. Werner, 2017

Banks and blockchain do not need to stand against each other. They often currently do, and this is because banks are viewed as centralised aggregations of power and an enemy of DeFi. Blockchain aspires to be the opposite. That drives the ethos of web3 - to decentralise and to do public good. Valhalla Network brings that ethos to banking.

Most people's understanding of banks probably makes the idea of a not-for-profit bank seem impossible. This is the beauty of community banks, which, although becoming rarer, do still exist. This type of bank has a long and remarkable track record having been tried and tested in the three countries with the largest number of banks on Earth: the USA, Germany, and China. Community banks are so robust and important for the economy that they rarely go bust. Also, they are much more accountable than international banks - not one community bank in Germany required bailing out by taxpayers during the 2008 financial crisis!

How are these banks different? They focus on the community they serve over profits. They are still profitable - being not for profit is different from non-profit – they just profit differently. Instead of maximising fees, avoiding taxes, and trying hard to extract money from customers, community banks lend ethically and work hand-in-hand with small businesses. This results in greater business competitiveness and greater general prosperity. Small businesses, all together, are the biggest employer in most countries and are the backbone of any economy. They need banks to serve their needs!

Valhalla Network's mission is to build a network of community banks governed by a decentralised autonomous organisation (DAO). The DAO will be a majority stakeholder in those community banks and use the profit from all the banks to launch more community banks. The remaining shares not owned by the DAO will be split between incentives for bank staff and charitable foundations that use profits to fund local, social, and charitable initiatives. Reinvesting a portion of profits back into the local economy amplifies the benefit.

Due to the capital requirements of starting a bank, before Valhalla Network starts any community bank, we need to build a capital engine that can help fund the creation of more banks and reward the DAO community. We need a way to ensure value for the token holders quickly and a way to fund the creation of the network of community banks. Valhalla Network will fill this need with a single for-profit bank whose target customers are sovereign entities. The great thing about for-profit banks is they are enormously profitable, and once the for-profit bank obtains its banking licence, the capital needed to fund more banks will be more readily available.

A banking licence takes time, and the funds received from early token holders will fund three things: the balance sheet of the bank (80%), building the bank, and obtaining the banking licence (both 20%). The funding must be in place to apply for the licence, and to get the licence you must build the bank. The bulk of the funding is released and used only on the condition that Valhalla Network is ready to obtain a bank licence. In the unlikely event that doesn't happen, that approximately 80% is returned to funders.

Since the banking licence will likely take between 18 months to two years to obtain, token holders should expect to hold their tokens for some time, but this longer-term strategy pays off

with controlling interest in a bank. The DAO will decide what to do with the profits after the bank starts operations, including funding the mission. The minimum value of the token will be high because its value can be derived from real-world cash flows generated by the bank.

Why this mission? Why do this with a bank? Because modern banking is broken. The incentives are all wrong. Banks should exist to serve the communities in which they reside, but big banks simply don't. They should provide credit to small and medium enterprises, but as they get bigger, they stop doing that. What banks do with their money matters, especially with the size of modern banks. Where they put their money moves national economies. Neither banks nor the national central banks that control the money supply take their responsibility for the economy's health seriously. Their incentives twist their mission.

Valhalla Network sees a better path.

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1 Problem Statement

Modern banking is fundamentally misunderstood. Banks are not financial intermediaries as widely believed, but actually creators of credit. Every time a bank extends a loan, new credit is created out of nothing. This extraordinary power of credit creation shapes entire economies, yet remains largely unrecognised. Where banks direct credit has an impact on which industries thrive or fail, and a nation's economic growth.

Despite being the backbone of most economies, small and medium enterprises (SMEs) are underserved by today's increasingly centralised banking system. SMEs account for approximately two-thirds of total employment and 98% of businesses across economies. However, as banks consolidate and grow larger, they reduce lending to SMEs. Empirical evidence shows that large banks favour lending to other large corporations and speculators, rather than productive business investment.

This squeezes SMEs, which rely heavily on bank lending as their main source of external financing. With limited access to capital markets, bank credit is critical for SMEs to survive and grow. Yet a staggering \$5 trillion global credit gap exists for SMEs according to the OECD. Constrained access to affordable credit from major banks stifles SME growth, innovation and job creation.

SMEs require relationship banking and tailored services not provided by large, detached institutions. Surveys show SMEs want personal interactions with bankers who understand their business needs. However, major banks prioritise transactions, algorithms and profits over building relationships with small businesses.

This broken system causes recurring boom/bust cycles by misdirecting credit into asset speculation rather than productive investments. The solution requires democratising finance by decentralising banking itself. Just as SMEs are the backbone of local economies, community banks must become the backbone of banking. This will properly align incentives to channel credit for public good rather than shareholder return.

Valhalla Network aims to transform finance and lending by establishing a decentralised network of community banks. These banks will serve SMEs and local communities as their primary mission. By decentralising banking, Valhalla Network will help redirect the extraordinary power of credit creation to where it can do the most economic good.

2 Solution

We have a mission: to create a global network of community banks that are governed by the people and work for the people. These community banks will primarily focus on lending to small businesses in their local areas, addressing the significant credit gap that exists and supporting those businesses that are overlooked by larger banks. Our goal is to unlock credit for small and medium-sized enterprises (SMEs), fostering sustainable economic growth without inflation.

Valhalla Network will achieve this by combining the principles of decentralisation and the potential of Web3 with the power of banking. The Valhalla Network Foundation, the legal entity responsible for fulfilling the mission, will be governed by a decentralised autonomous organisation (DAO) consisting of governance token holders. This DAO will oversee the use of the Foundation's resources, always keeping the end mission in mind.

Germany serves as an excellent example of a high output banking system designed to support small businesses. With over 1500 community banks known as Sparkassen, Germany has empowered local lending to small businesses, unlocking investment and growth opportunities that are often unavailable to the majority of small businesses in Europe. This decentralised banking system has contributed to Germany's success in nurturing numerous "hidden champions," small businesses that are leaders in their niche sectors, and has made Germany a global economic powerhouse. These banks provide personalised services with local bankers who build strong relationships with SMEs. Moreover, loans to small businesses mainly result in productive credit creation, fostering economic growth without inflation. Notably, during the 2008 crisis, not a single community bank in Germany required a taxpayer bailout.

So what is productive credit creation? Credit creation can be categorised as either productive or unproductive depending on its purpose. Productive credit creation is credit used for real economic growth - such as credit used by a small business to invest in new machinery to produce more goods; this creates new income streams that can be used to service and repay the loan. Repayment of the loan destroys the newly created credit resulting in zero net change in credit and no inflation. With the new income streams generating economic growth, productive credit creation results in GDP growth without inflation.

The following chart shows some indicative evidence for the UK that *the smaller the firm, the more likely it is to use borrowed money to for productive purposes* like investment in machinery, improved processes and better quality goods and services offerings. Large firms, although they also may use borrowed funds for investment and capital formation, likely do so to a lesser extent.

Although non-bank financial institutions (NBFIs) can grant loans, only firms with a banking license (banks) can create new money. This extraordinary power comes about from banks being able to issue deposits and grant credit, without the need to segregate or keep a matching amount of liquid funds for the deposits they have issued, thus allowing them to expand deposits by granting loans.

Valhalla Network strives to build upon this highly successful SME-centric banking model by bringing community banking to countries and communities with the most need. By establishing thousands of community banks, Valhalla Network will decentralise the "front-end" of banking. Additionally, Valhalla Network decentralises the governance of the system through a Foundation that is governed by a DAO, enhancing transparency and accountability. This approach democratises finance and amplifies people's voices in a system that should serve them, rather than being controlled solely by self-interested parties.

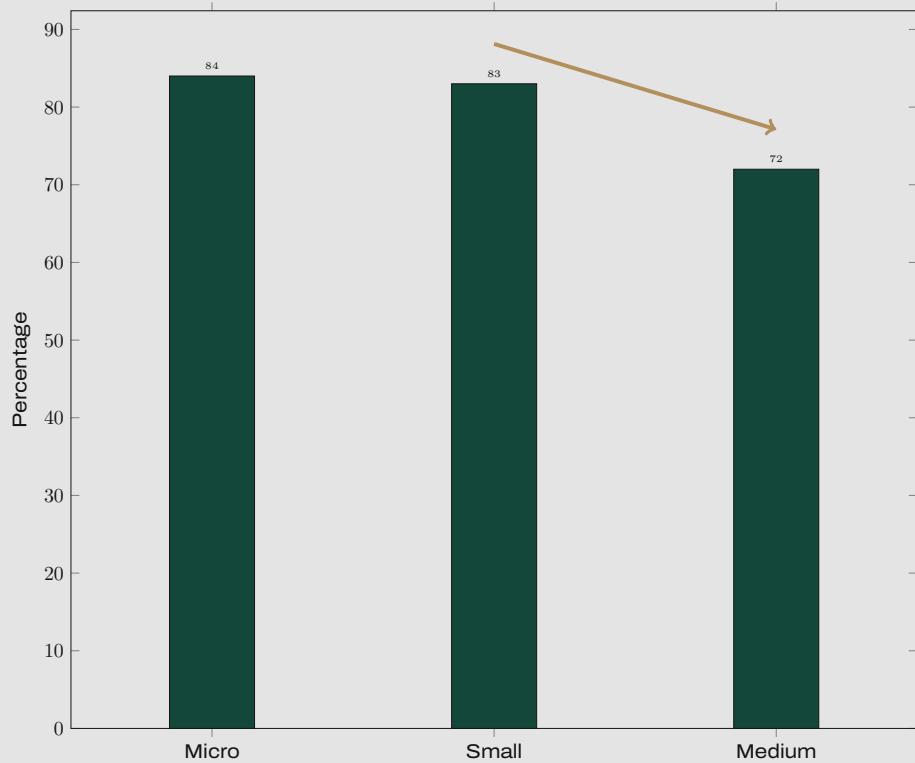


Figure 1: Use of external finance for investment, by borrower size

Investment is the sum of acquiring capital equipment or vehicles, investment in a new or significantly improved goods or services, and investment in a new or significantly improved process. No data available for large firms.

While Valhalla Network Foundation will own 75%, each community bank will be 25% owned by a local charity foundation, established in partnership with the bank, creating a closer bond between the community and the bank. Through this structure, local community leaders will actively participate in deciding how 25% of the dividends will be reinvested into community initiatives.

As we launch community banks, the network grows stronger, benefiting from shared IT infrastructure and start-up expertise. This allows Valhalla Network to reduce scale-up costs as the network expands.

3 Community Banks

Valhalla Network's community banks will be established with the local people, businesses, and economy in mind. Each bank will remain small, approachable and geographically restricted to supporting SMEs in the local area. By geographically restricting the bank's operations, it encourages the bank staff to focus on all the small businesses within the local area and create solutions for a variety of financial needs.

The bank will employ local bankers to be 'on the ground' building face-to-face relationships with businesses, forming mutual trust and a better understanding of the customer's needs. As a way of forging a stronger bond between the bank and its local community, staff will also be encouraged to be active community members.

SMEs' Opinions on the UK Banking System

Difficult

"Loans are increasingly difficult to get. Unless you can provide a charge on your home, banks do not want to know."

Contempt

"My bank treats me with contempt. Just because I'm a micro business, I do not get the same service as a big business."

Tedious

"Call center staff use scripts. Telephone banking is extremely tedious, time consuming and sends you in loops."

At all times the community bank will be 'customer centric', offering customers dedicated relationship managers with whom they can speak to and in-person meetings, preventing digital exclusion;

this traditional relationship led banking is starkly different to the corporate disconnect seen with large banks who prefer to employ international call centres, and who prioritise relationships with large corporates and bottom line profits over the needs of small businesses.

Additionally, SMEs are often forced to pay high fees by banks seeking to squeeze these businesses for additional profits; the fees are usually justified in complicated contracts and terms that are unfairly forced on customers seeking financial support.

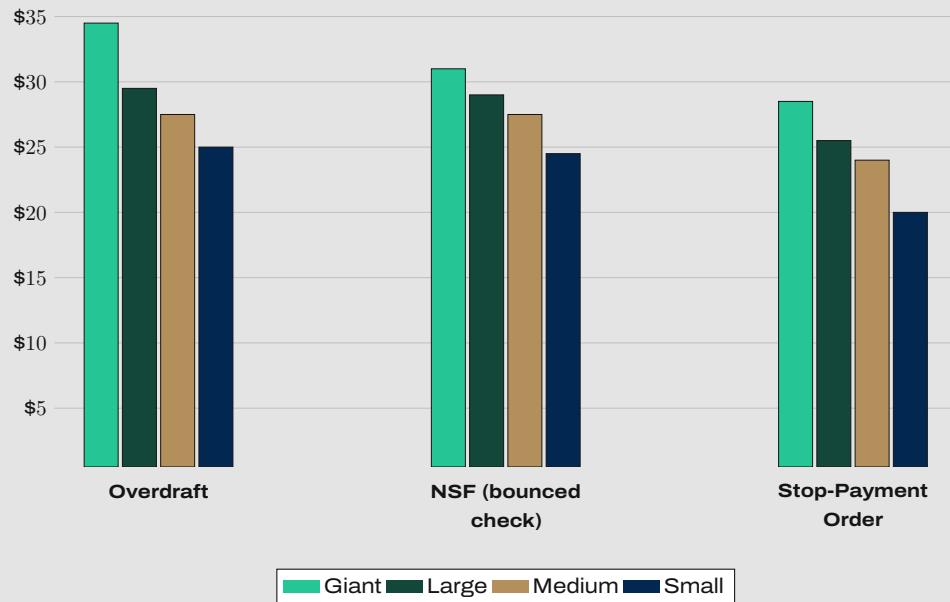


Figure 2: Average Fees By Size of Financial Institution in 2009

Source: Moebs Services

Notes: Data includes banks, thrifts and credit unions. Small institutions are defined as those with \$100 million in assets or less. Medium are those between \$100 million and \$1 billion in assets. Large institutions are \$1 billion to \$50 billion in assets, and giant ones have more than \$50 billion.

Further, a recent SME survey conducted in Norfolk, UK, highlighted a strong demand for Valhalla Network community banks, banks that prioritise local lending and distribute a portion of profits back to the community.

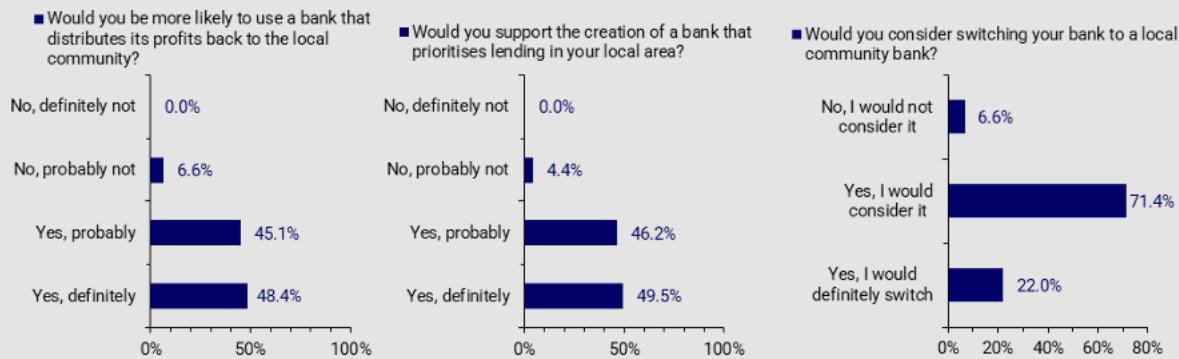


Figure 3: SME Sentiment Towards Banks

It is forecast that after 5 years in existence, each one of Valhalla Network's community banks will have served over 2,000 local small businesses. As small businesses are net job creators, it follows that after 10 years each bank will have created or preserved 5,000 local jobs. As a result, Valhalla Network will boost employment, local economic growth, and help combat inflation.

As previously mentioned, the bank will be 25% owned by a local charity foundation whose responsibility it is to reinvest dividends back into local community initiatives and development programmes; this provides an opportunity for local representatives to be trustees of the charity foundation and actively involved in distributing profits to the community, increasing local support for the bank. In addition to the Foundation's community integration, we envisage the bank engaging with local schools to provide financial education to teenagers and young adults. The bank will be a hub for local economic growth.

The remaining 75% will be owned by Valhalla Network Foundation, a charity foundation established in Liechtenstein. All banks within the network will be 75% owned by the Foundation creating positive cash flow for Valhalla Network whose assets will be under governance of the DAO. Further information on governance is available in 'Foundation Governed by DAO'.

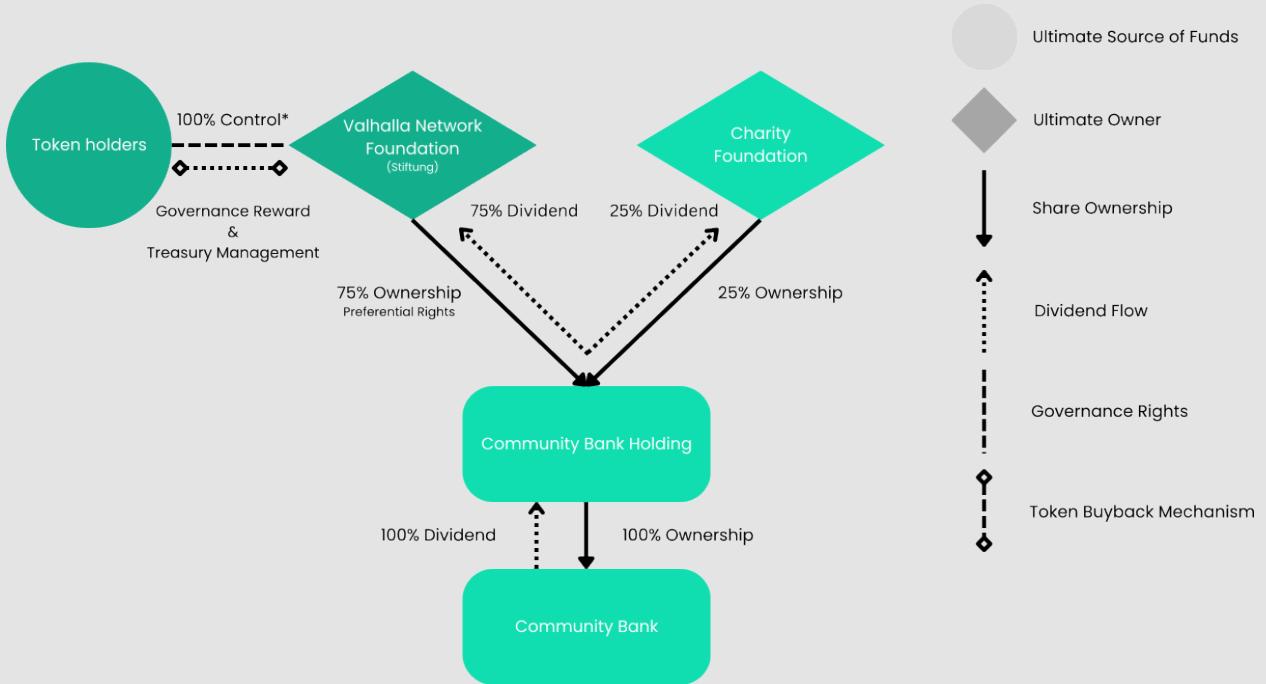


Figure 4: Community Bank Ownership

3.1 The Community Banking Mission Statement

Valhalla Network community banks will strive to become the preferred banking partner for local SMEs by:

- Introducing competition to the concentrated banking sector;
- Enhancing credit availability;
- Creating tailored banking services for small businesses; and,
- Offering truly attractive savings packages for depositors.

By fostering strong relationships throughout the local community and local businesses, each community bank will generate healthy sustainable returns for both Valhalla Network Foundation and the respective Charity Foundation.

While community banks are still quite profitable, their mission doesn't prioritise profit at the cost of the community. We envisage each community bank to take 3-4 years to become profitable as it connects to the local businesses and expands its portfolio.

4 Anchor Bank

It is important to acknowledge that community banks can take a few years to become profitable due to the nature of their business model and gradual portfolio growth; this steady approach

is different to the wildly fluctuating web3 space where investors demand results much sooner, which can be detrimental to the underlying mission of the project.

To meet investor expectations without putting at risk the project, Valhalla Network will work towards fulfilling its overall mission in two phases:

Phase 1 is the establishment of a specialised bank in Liechtenstein; its purpose is to act as the anchor bank for the entire network, generating profits much sooner than a community bank due to a highly efficient proprietary business model. This will be the primary source of cash until the community banks become profitable.

Phase 2 is the establishment of the community banking network that will gradually grow and generate steady returns for Valhalla Network Foundation.

Contrary to traditional banking models, the anchor bank can combine higher returns with a buffered financial model; it can immediately begin generating returns for Valhalla Network and can achieve an average return-on-equity (ROE) of 24.9%, significantly higher than market average. The strong real world cash flows generated translates into an attractive return-on-investment (ROI) for Valhalla Network Foundation, reaching a 5-year ROI of over 565% on Valhalla Network's initial investment into the anchor bank. We forecast the anchor bank to begin operations shortly after our token generation event (TGE).

The fundamental aim of Phase 1 is to create an anchor bank to support the Foundation in its infancy with early cash flows. It will serve as an economic pump, propelling Valhalla Network into Phase 2 when the Foundation can allocate a portion of the received dividends to the creation of new community banks. This phased approach allows us to establish more community banks earlier than if we immediately started Phase 2 and relied on community banks alone.

The anchor bank's business model was designed by Prof. Richard Werner using his 30+ years' experience studying the inner workings of international banks to create a highly efficient low risk model. As with the community banks, the business model will be exposed to the most rigorous and challenging process by the financial market authority (FMA), Liechtenstein's banking regulator, who will explore all areas of the business plan, financial model, stress tests, disaster recovery plans, and other areas of the business. The regulators will perform the most stringent tests on the business model, and the start-up team has to evidence through stress-tests that the business model is robust enough to survive improbable harsh market conditions. Essentially, the banking license won't be granted until the FMA is confident in the model and that the bank will be profitable. Therefore, although the business model is proprietary, the details of the anchor bank's business model is irrelevant to token holders.

Our forecasted anchor bank metrics are below¹:

¹As the anchor bank matures and provides increasing returns, we envisage the DAO will vote for the Foundation to inject additional funds yearly to further increase returns.

	TGE+1	TGE+2	TGE+3	TGE+5	TGE+10
Texas Ratio	7.73%	8.57%	8.12%	8.23%	7.28%
Book Value / € M	83	223	393	767	2232
Capital Subscribed / € M	75	175	275	375	375
Dividends paid to the Foundation² / € M	0	5	14	43	172

Table 1: The Texas Ratio assesses a bank's financial position by taking a ratio of non-performing assets by the sum of the bank's tangible common equity and loan loss reserves. A ratio above 100 means the bank may need to cover potential losses; a low Texas ratio means the bank has sufficient resources to cover potential losses.

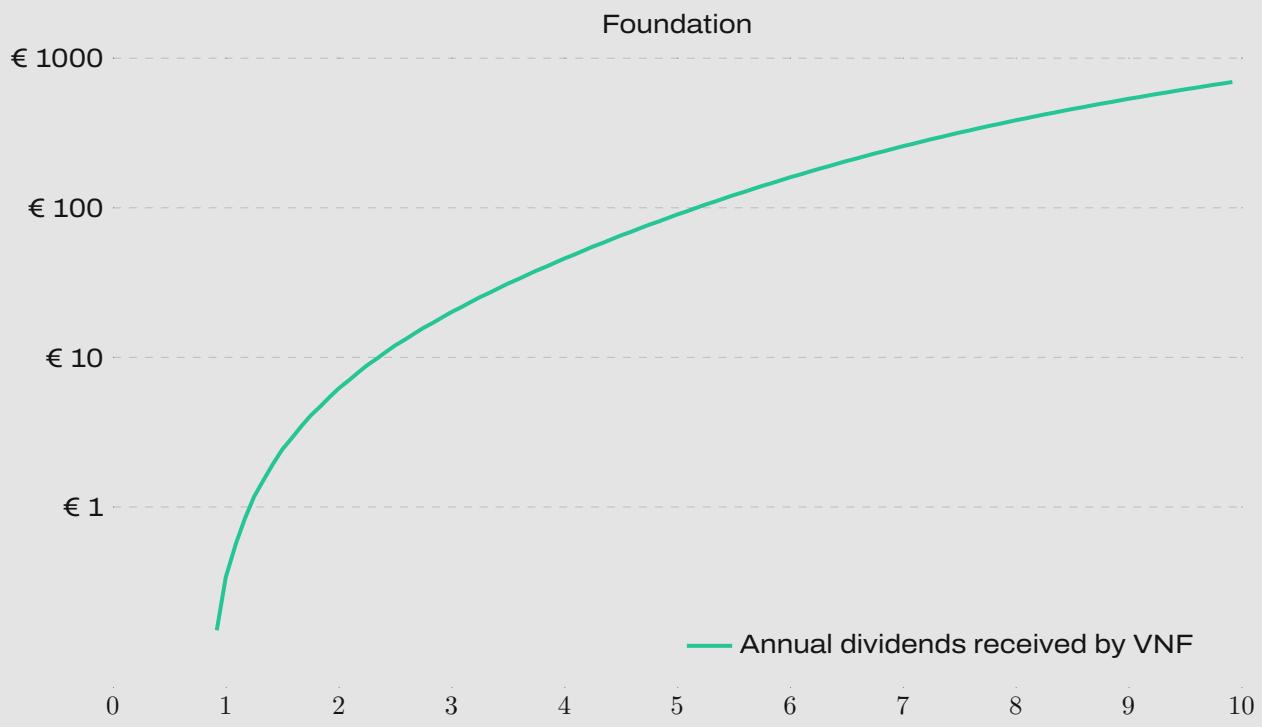


Figure 5: y-axis (€m per year)
x-axis: time since authorisation of Phase 1 Bank (years)

Generally, the more tier 1 capital a bank holds, the more profitable it can be; therefore, we envisage returns to increase as the bank grows and stockpiles greater levels of capital.

The total value of the Foundation will be a combination of the underlying cash flows, any premium from the distributed ledger ecosystem, the intrinsic value of bank licences, and the public good done by the organization.

Despite the forecasted strong returns generated by the anchor bank, it is worth noting the financial model contains built in buffers and higher than forecast loan provisions. Examples include:

- Cost of funding is set considerably higher than we can achieve;
- Return on assets is set significantly lower than actually achievable;
- Start-up costs are budgeted higher than necessary, and;
- Across the portfolio, probability of default and loss given default (LGD) are set higher than risk ratings suggest.

The banking sector is one of the most regulated industries with regulators spending large amounts of capital and time on managing a bank's risk. The regulators set several ratios the anchor bank must meet (such as liquidity coverage ratio, leverage ratio, CET1 ratio, and others), its financial model not only meets the ratios but far exceeds them. The anchor bank will be majority owned by Valhalla Network Foundation, the charity Foundation established in Liechtenstein, with the other 25% assigned to staff options and other private shareholders. Valhalla Network Foundation will be the only qualifying shareholder. Being a 75% shareholder, the majority of the dividends will flow to Valhalla Network Foundation providing the Foundation with positive cash flows to reinvest in new community banks or to support governance participation rewards for the DAO.

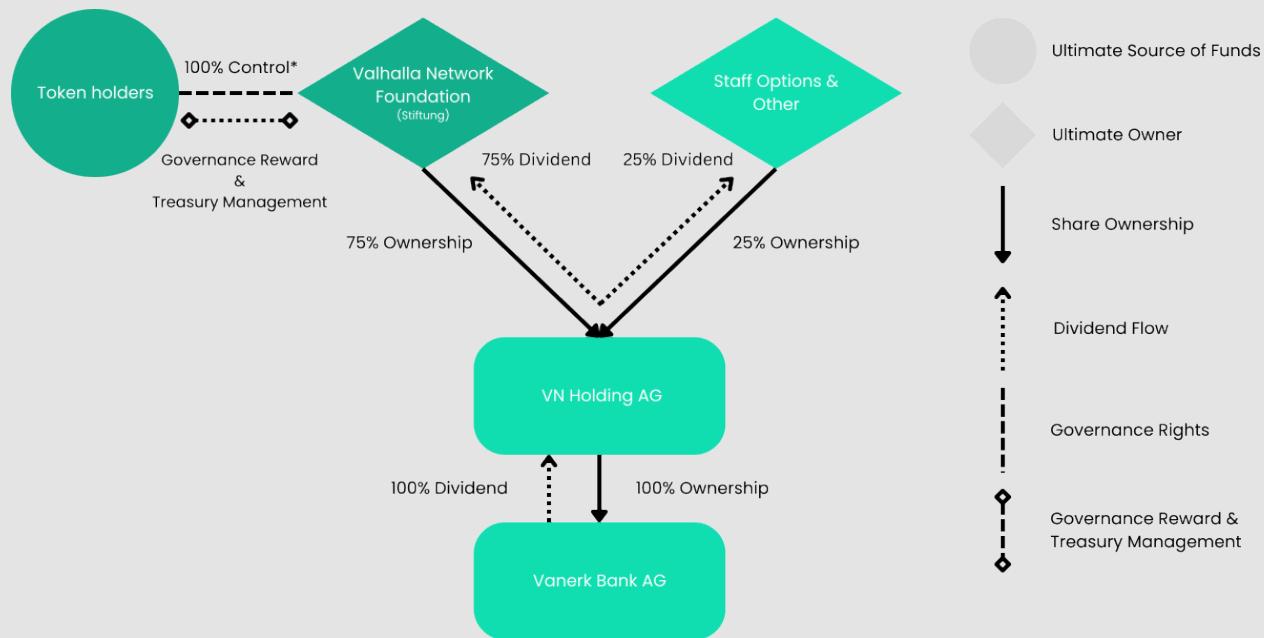


Figure 6: Anchor Bank Ownership

It is crucial to note that, like with any bank shareholder, the Foundation will own but not manage the anchor bank; each bank will be a standalone legal entity with its own balance sheet, and they will be managed individually by experienced senior bankers, who are required to pass regulatory interviews. These experienced bankers will manage the day-to-day operations of the bank with a regulated board of directors in place to oversee the bank's operations. At no time will there be undue influence from any shareholder on the bank itself. See GOVERNANCE for further information on DAO governance of the Foundation. Liechtenstein's forward-thinking approach

to crypto regulations, particularly following Liechtenstein's blockchain act, aligns well with our anchor's bank's intended legal structure. By establishing both the Foundation and our anchor bank in the same jurisdiction, we are able to streamline applications under the same jurisdiction and same legal team; this enables us to avoid having to interface with multiple regulators cross-jurisdiction, potentially leading to a faster and more cost-effective path to obtaining the necessary license. Lastly, Liechtenstein has forged strong relationships and ties with influential neighbouring countries making it an ideal country for our anchor bank.

5 Valhalla Network DAO

Since the mission is to democratise finance, Valhalla Network will operate as a Decentralised Autonomous Organisation (DAO). A DAO is a new type of digital organisation, governed by rules agreed upon and encoded on the blockchain, rather than rules set and controlled by a centralised authority.

Contrast this with a traditional company with a hierarchical structure, where a CEO or board of directors make the important decisions, and thereby control the company. This structure often works, but it has its limitations.

In a DAO, governance of the organisation is open to all who have interest in the success of the organisation. This interest is gauged by the number of tokens the person has, and simply having tokens grants the ability to propose ideas, discuss them openly with other holders, and then vote on the decisions that make it formal governance. Essentially, you have an organisation that's governed democratically by its stakeholders. It's a bit like a co-op in the real world but with the added advantages of blockchain technology, like transparency, security, and the absence of geographical boundaries.

So why should you prefer this type of organisation? How does Valhalla Network benefit in operating this way?

- Power Distribution: Valhalla Network stands opposed to the highly centralised banking system currently in operation. A DAO structure spreads power out among all stakeholders, allowing anyone with interest a voice in the operation of the DAO.
- Transparency: Everything governed and done on behalf of the stakeholders is in the open, recorded and visible for all to see. There's no room for the backroom deals or hidden actions that go against the stakeholder's interest. These sorts of hidden deals plague centralised banking.
- Efficiency: Decisions are made, and because of the DAO structure being encoded into the blockchain, the collective decision happens.
- Resiliency: Because DAOs are decentralised, they can last. There is no centralised power structure to undermine, like a CEO being poached by a rival. There's no single point of failure.

Valhalla Network is being built to last a long time, with a mission of creating many community

banks and thus decentralising finance.

With all the benefits of running a DAO and granting stakeholders governing rights, there is one big consideration while running a DAO - that governance by a large group is slow. While the quality of governance goes up with an involved and incentivised group or stakeholders, it takes time to coordinate that governance. For this reason, and for reasons of legality, the DAO will operate at least one foundation, empowered to operate in real time on behalf of the DAO.

6 Foundation Governed by DAO

While the governance of Valhalla Network is done through the DAO, the operations will be run through the Valhalla Network Foundation. Starting and running banks means that Valhalla Network will be working in one of the most regulated business sectors there is, and that requires us to maintain companies in the jurisdictions from which we will legally operate. This obliges us to run at least one foundation, along with several other companies related to the structuring banks. The Valhalla Network Foundation is responsible for executing the will of the DAO. Because this is a Foundation that operates in a highly regulated space and in the Lichtenstein jurisdiction, there are several things to make clear about the relationship of the DAO and the Foundation.

The Foundation Must Operate Within the Law: The DAO, during its governance operations could mistakenly attempt to compel the Foundation to do something illegal through its governance. To ensure the safety of both the stakeholder's assets, and the legal operation of the Foundation, there must be a backstop in place to prevent jurisdictionally illegal governance or undue influence from putting the Foundation at risk. Therefore, Valhalla Network Foundation will employ a Board of Directors whose responsibility is to execute the will of the DAO within the law. The board will be subject to elections and recall through DAO governance, will be fiduciarily responsible to the DAO. If the DAO either mistakenly or intentionally governs in a way contrary to the law, the Board will be responsible for nullifying that governance with full reporting to the DAO on the reason for doing so, and guidance for moving forward with the governance intent if that is appropriate. This will include writing new governance proposals if necessary.

Real Time Problems Must Be Handled In Real Time: DAO governance is not suited to reacting in real time, as well-crafted governance takes days, weeks, or even months to conceive, publish, and vote into being. For this reason, the foundation will employ both a Board of Directors and various committees and appointees to act on the DAO's behalf. All of these individuals will be under contract and will be fiduciarily responsible to the DAO, and they will also have the authority granted to them by the governed bylaws to act immediately within their purview. Two examples would be physically signing documents with signing authority for the foundation that starts a new bank, or reacting to real time metrics related to tokenomics. Where the DAO needs to act quickly, or needs to act physically, the Foundation employees will fill the gap between DAO governance and real time/physical need.

The DAO Does Not Govern Bank Activities: Banking is one of the most regulated industries in the world, and they must operate within those regulations. A holding company will own the bank,

and the bank's operations will be according to applicable regulations within the jurisdiction where the bank operates. Valhalla Network Foundation will own 75% of each Bank holding company, and will collect dividends through that holding company. In this way, the operations of the bank will be separated from the operations of the Valhalla Network and the Foundation, both of which will benefit from owning, but not directly controlling the bank.

6.1 Governance

Valhalla Network will primarily consist of the DAO and the foundation the DAO controls. Given the mission of expanding community banking, the DAO needs to last for the lifespan of multiple banks, from the bank's creation to its closure. This means the lifespan of Valhalla Network is decades or longer. For this reason, the governance structure of Valhalla Network needs to be solid and reliable over a long period of time.

The governance process within Valhalla Network consists of two distinct phases: proposal creation and discussion, followed by the formal vote. During the proposal creation and discussion phase, all stakeholders can and should engage in discussions and contribute to the formulation of proposals. These discussions take place in a dedicated forum application, such as Discourse, and operate under a governed ruleset intended to foster productive exchanges. In this phase, the number of tokens a stakeholder has does not dictate influence, and each participant is granted a single vote on the promotion of potential proposals to formal governance. This keeps the ideation phase of governance more like a conversation between equals. Each stakeholder has a voice, with the ability to comment on and refine proposals, which ensures a collaborative and inclusive decision making process. This phase of governance ends in an informal vote within the forum to promote the proposal for a formal on chain vote.

Once the stakeholders deem the proposal ready, a select group of authors convert the forum proposal into the necessary format for a Snapshot vote. The group of authors will be subject to governance, and initially consist of team members and will likely grow to include foundation members. Each proposal will include a reference to the discussion that created it. Snapshot allows votes based on a snapshot of balances at a specific point in time on the blockchain. The reason for choosing Snapshot is that voting does not cost gas, and it integrates with Safe multisig wallets. Through the use of Zodiac extensions for Safe wallets, the DAO can directly control all on-chain assets, rather than have a trusted group of signers execute on the DAO's behalf.

There are two types of proposals, those that affect on chain assets, and those that do not. For any vote that will affect on-chain assets, the proposal's structure will include execution instructions using the Zodiac set of extensions to the Safe wallet. Upon a passing vote, the execution phase begins, which includes a verification step to ensure the proposal as written did pass. Once the proposal verification is complete, then the execution phase begins, with a delay set up to ensure the possibility of cancelling execution if an unforeseen issue arises. After the delay, then any participant can finalise execution by paying the gas. The team members and foundation will ensure this happens, but any stakeholder could do so if they choose.

For the second type of proposal, where on-chain assets are not affected, the execution follows whatever path is required to ensure the proposal takes effect. For a community bank proposal it will initiate the work around creating that bank, for a bylaw change, this would include updating the bylaws. This form of governance creates an obligation for the team members, the foundation, and for stakeholders, and while execution of the proposal is less scripted than an asset action, the proposal is still mandatory. For this reason, proposals require the inclusion of success criteria, so the proposal's status can be updated appropriately when the execution is complete.

To ensure smooth initial operations and successful operations and control of the foundation, Valhalla Network will need to bootstrap its governance. The founding team will create bylaws prior to the initial launch of governance, with the understanding that any such bylaws are themselves subject to governance by the DAO. This proactive measure gives the DAO a solid foundation right from the start, while giving Valhalla Network members the power to shape the governance structure through active participation.

Banking, as a highly regulated industry, necessitates conditional governance within Valhalla Network. The foundation, which operates in the real world on behalf of the DAO, must strictly adhere to legal and regulatory requirements. While the governance decisions of the DAO hold significant and primary weight, the foundation's board retains the authority to overrule governance based on legal and regulatory considerations. Crucially, any intervention by the board in the governance process will be executed with utmost care and sensitivity. The board's participation throughout the governance process is intended to prevent situations where intervention becomes necessary, as open conversations about legality and regulations should ideally occur prior to formal governance proposals. Although the intention is for governance proposals to be crafted in alignment with all laws and regulations, there may be exceptional cases where even with the best of intentions and guidance, board intervention is still required to safeguard the interests of the DAO, the foundation, and Valhalla Network. To ensure transparency and accountability, the board of directors are obligated to provide timely and comprehensive reports, outlining the legal and regulatory reasons behind any decision to overrule a proposed governance action. This reporting mechanism serves to maintain the integrity of the DAO, the foundation, and Valhalla Network as a whole. By maintaining this 'check and balance' relationship between the DAO and the foundation, Valhalla Network ensures that the governance structure operates within legal boundaries while upholding the principles of transparency, accountability, and protection of stakeholders' interests.

6.2 Execution and Day to Day

The day-to-day execution of Valhalla Network is carried out through the collaboration of the DAO and the foundation it controls. A unique dependence between these two organisations is at the heart of Valhalla Network's operation framework. By examining the key functions performed by the DAO, the foundational role played by the organisation, and the seamless interaction between these entities, we gain a comprehensive understanding of their integral roles within the network.

The DAO serves as the driving force behind Valhalla Networks decision making processes. In its day-to-day, proposals are conceived, evaluated, and ultimately voted upon. These proposals encompass a wide range of action and changes, from updates to network bylaws to strategic decisions that shape the future of Valhalla Network. Through a transparent and democratic voting mechanism, the DAO ensures every member's voice is heard, fostering an environment for reaching consensus.

Meanwhile, the foundation, established as a legal entity in Lichtenstein, assumes a critical role in the network's operational structure. Governed by bylaws shaped and voted on by the DAO, the foundation is the executor of the DAO's will. Its board of directors oversees the day-to-day operations, ensuring the decisions made by the DAO are effectively implemented. This oversight extends to regulatory compliance, legal obligations, and safeguarding the interests of both the foundation and the DAO.

To support its endeavours, the foundation will establish and maintain various committees within the DAO governance structure. These committees have specific purposes, each focused on a single mission that aligns with or advances Valhalla Network's objectives. For instance, a committee may be tasked with launching a community bank, while another may oversee the remuneration of foundation members. These committees function with defined objectives, adapting to the evolving needs of the network.

In addition, the foundation may employ empowered individuals who possess specialised expertise required for specific purposes or missions. When there is a need for real time response, it is not feasible to demand a committee or DAO decision; this is when this type of foundation member will be necessary. These individuals help with executing tasks that benefit from an individual's dedicated focus, and allow the DAO and foundation to ensure certain things are taken care of in real time.

Crucially, both the DAO and foundation operate under the governance of the DAO. Every member, whether in an executive role or not, is subject to the DAO's governance framework. Elections for executive positions occur periodically, likely starting out yearly, ensuring business continuity, while procedures for member removal are outlined in the DAO bylaws. Transparency and accountability are paramount, as the DAO retains governance authority over all foundation members.

In terms of financial management, the foundation operates with governed budgets held in bank accounts or on-chain multisig wallets. These budgets, subject to DAO governance, are allocated for contractual payments, payroll, and other obligations that align with the network's goals.

The foundation's board of directors exercises oversight of executive staff and committee and individual actions, ensuring compliance with regulations, legal requirements and the best interest of both the foundation and the DAO. Their collaborative efforts service to maintain operational stability, legal integrity, and efficient execution of the network's mission.

The interdependence between Valhalla Network and the foundation is the cornerstone of its

operational framework. The DAO takes charge of governing and guiding the network's decision-making processes, while the foundation assumes responsibility for the day-to-day operations.

7 Incentives and Behavior

Governance of a DAO is no small feat; it requires ongoing attention and effort to ensure its sustained operation. With Valhalla Network being a DAO built with a mission intended to endure for decades or even longer, the need for meaningful participation in its governance is paramount. To this end, the incentive structure of Valhalla Network's DAO is designed to encourage active and informed governance participation.

One key aspect of incentivising participation in Valhalla Network's governance is the introduction of a governance reward mechanism. Token holders are given the opportunity to lock their tokens for specific time periods. By doing so, they become eligible to receive rewards based on their meaningful engagement in governance activities. This engagement is predominantly, measured by the number of votes cast, but may also extend to the active participation in governance discussion and the creation of impactful governance proposals.

The allocation of the budget for governance rewards lies within the purview of the DAO itself. This approach allows the DAO to adjust the reward mechanism based on the evolving needs of the network. It ensures that incentives remain effective and adequately aligned with the network's goals.

To perpetually fund these incentives, Valhalla Network incorporates a mechanism for reacquiring tokens from the market. This ensures that the necessary resources are available to sustain the governance reward program over time. The mechanics of this reacquisition system are implemented through smart contracts, which enable token holders to regularly exchange their Valhalla Network tokens for Ether or other currencies deemed suitable by DAO governance. By maintaining a balance between providing meaningful incentives and offering an exit option for holders, this mechanism sustains the reward program while accommodating individual liquidity needs.

8 Fundraising and Token Details

Valhalla Network will have a single circulating ERC20 utility token, issued on the Ethereum network and bridging to other networks as necessary. These utility tokens will primarily serve the purpose of providing governance rights to Valhalla Network DAO. The total number utility tokens will remain capped at 4 billion.

8.1 Early Funder Protection

Our project stands out among many start-ups due to its controlled downside risk. We anticipate 'spending' only 20% of the total private investment we raise, while assigning the remaining 80%

as tier 1 bank equity. This allocation effectively serves as collateral for the bank.

In the event that Valhalla Network is unable to obtain a banking license and, after exhausting all contingency plans, decide to wind up the project, a significant portion of the funds (approximately 80%) could still be available and be returned to investors. This aspect distinguishes us from the majority of start-ups where investors bear the risk of losing 100% of their investment from the outset.

8.2 Phase 1 Fundamentals

The 80% of capital securely held in reserve will be exclusively allocated as common equity tier 1 (CET1) for the Anchor Bank in Phase 1. The remaining funds, excluding the funds dedicated to banking capital, Valhalla Network will use towards the development of the protocol and the preparation of the bank for its operational phase.

The setup and launch of the for-profit Anchor Bank will take approximately 18-24 months from the initial date of the private sale. This timeframe encompasses various tasks such as establishing the foundation and banking entity, implementing the technical solution, and applying for and obtaining a banking licence.

Rather than typical DAO staking, token holders can receive governance rewards as described earlier. These will start with an Annual Percentage Rate (APR) of 5% which will be available to circulating tokens and locked investor tokens; the team relinquishes its rights to receive these rewards while their tokens are locked. Valhalla Network will replenish the governance rewards using the reacquisition strategy described previously. The DAO will have the flexibility to adjust the APR to align with market conditions and meet the incentive requirements.

There is a maximum of 4 billion mintable governance tokens. The breakdown of the total governance tokens is illustrated in the chart below:

The primary function of the unallocated treasury tokens will be capital raises, with secondary functions including governance rewards, contingency funds and other needs as governed by the DAO. The Team Category includes all tokens held by both foundation contributors and advisors. The volume and value of governance token sale rounds (excluding future governed capital raises for Phase 1 and Phase 2) are in the table below:

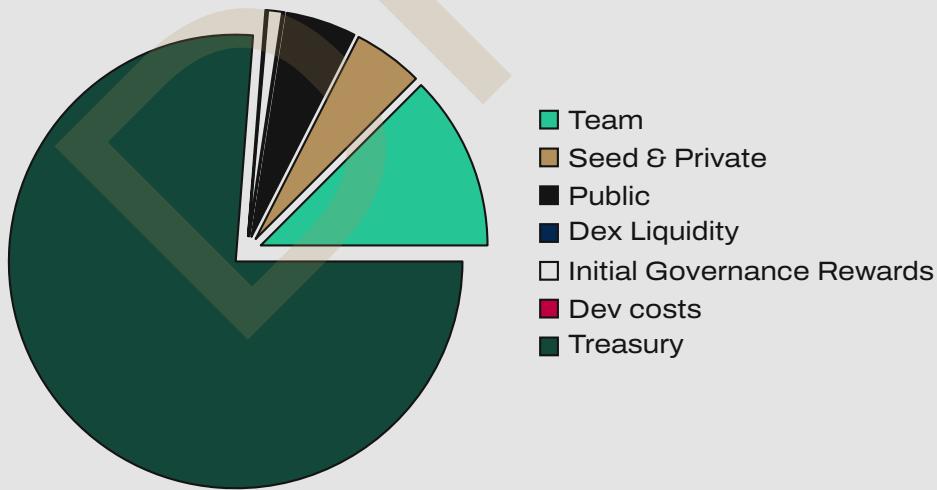


Figure 7: Breakdown of Total Governance Tokens

The Valhalla Network Treasury is allocated tokens to sustain future public sales, governance participation rewards, community initiatives, partnerships, and adverse market conditions. All of these are controlled by the DAO, and bring the benefit of increased decentralisation as tokens are sold or distributed.

Round name	Tokens Sold	Price per Token (€)	Value Sold (€)
Seed	7,500,000	0.080	600,000
Private – Round 1	50,000,000	0.100	5,000,000
Private – Round 2	20,000,000	0.105	2,050,000
Private – Round 1	121,000,000	0.120	14,500,000
Public sale	200,000,000	0.275	55,000,000
Total	c. 400,000,000	-	77,100,000

Table 2: Fundraising Summary³

8.3 Phase 2 Fundamentals

Once the Anchor bank is firmly established and the Valhalla Network DAO operates effectively through its governance and foundation, Phase 2 will begin. In Phase 2, Valhalla Network will begin creating a network of community banks. To raise equity for community banks, the Foundation will

³As originally proposed in 2022, the initial funding rounds and corresponding milestones forecast then were based on macroeconomic conditions of the time, with allowance for reasonable correction. We could not have anticipated what then actually transpired between the end of the year and into the first half of 2023 - the most aggressive regulatory actions and resulting bank consolidation since the 2008 financial crisis, with secondary and cumulative effects that reverberated across all markets. Investors naturally repositioned their portfolios which resulted in material impact on the availability and cost of capital. We immediately took action to protect the project and consolidated our positions to focus on the critical stages of the license application and related processes.

mint or unlock governance tokens from the unallocated Treasury. Dividends paid to the DAO will be utilised by the Foundation to regulate the circulating supply of governance tokens, following the conditions established by governance token holders.

During the establishment phase of the community banks, the Phase 1 bank will generate growing cash flows to support the DAO and token holders. Over time, a consistent influx of new community banks will become profitable, resulting in a fully self-sustaining system.

8.4 Vesting

All contributors and advisors to the Foundation will receive tokens to align their interests with the Valhalla Network community. These tokens will be fully vested for 24 months after the token generation event and then released at a rate of 4.2% per month until TGE+4 (Token Generation Event + 4 years). At the end of 4 years after the token generation event, all tokens will be unlocked.

Both seed and private sale tokens will follow similar vesting conditions as the team's tokens, except they will unlock 12 months after the token generation event at a rate of 8.3% per month until TGE+2.

Tokens sold to the public during the public sale will be locked during the sale, and become immediately available after the establishment of the liquidity pool by Valhalla Network.

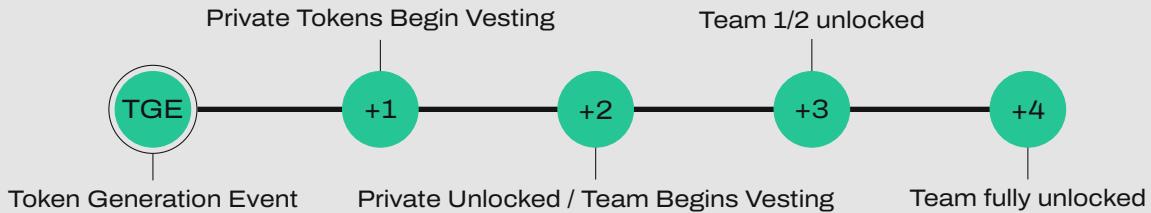


Figure 8: Token vesting timeline

8.5 Use of Funds

Valhalla Network aims to secure seed capital for the establishment of the first-ever DAO-owned bank in the Eurozone, along with obtaining regulatory approval and commencing operations. Following this crucial Phase 1, Phase 2 will witness the creation of a global network of community banks, providing support to small and medium-sized enterprises (SMEs) and local economies. To ensure investor protection, a significant portion of the funds raised, exceeding 80%, will be held in reserve for the anchor bank's capital requirements. In the event that Valhalla Network's team fails to obtain a banking licence, these funds will be returned to the investors as part of their safeguard. The breakdown of the capital raised is as follows:

- Seed sale: €600,000

- Initial Private Sale: €21,500,000
- Initial Public Sale (close to regulatory approval): €55,000,000 majority allocated for CET1 Capital, remainder allocated for DEX liquidity.

8.5.1 Use of Private Raise

Use of Funds	Assigned Funds (€)
Collateral (reserved capital)	17,800,000
Bank Setup Costs	3,700,000
Total Regulatory Bank Equity	21,500,000
Total DAO Costs	600,000

Table 3: Use of Funds

The initial private round stands as a pivotal phase in the capital raise process, holding significant importance. The funds generated from this round will be allocated towards building and establishing the Valhalla Network DAO, as well as laying the foundation for the Phase 1 for-profit bank. Additionally, a portion of the proceeds will be utilised to submit the banking application to the regulatory body in Lichtenstein. The majority of the funds raised will serve as liquid CET1 capital, necessary for establishing a bank. The portion of funds not held in reserve for bank capital, less than 20%, will be allocated towards covering bootstrapping costs. Further details regarding the protection provided to early funders can be found in the 'Early Funder Protection' section.

Valhalla Network will initiate the development and establishment of the DAO. Simultaneously, the team will develop the bank's IT systems, finalising bank procedures, and obtaining the necessary bank licences and certifications. Essential contracts will be secured for senior banking management, responsible for overseeing the bank's day-to-day operations and ensuring sustainable returns for the Valhalla Network community. These contracts will also encompass the administrative and office-based requirements of the bank.

Bank Setup Costs	Assigned Funds	DAO Costs	Assigned Funds
IT Systems	1,500,000	Skeleton Staff	280,000
Auditor and External Examiner	500,000	Operational Expenses	50,000
Legal	400,000	Smart Contracts Audit	50,000
Skeleton Staff	400,000	Legal	70,000
Office and Equipment	150,000	DAO Frontend	15,000
Fees	100,000	Penetration Tests	10,000
Contingency Funds	650,000	Valhalla Website	10,000
		Hosting	6,000
		Deployment of Contracts	5,000
		Contingency Funds	104,000

Table 4: Bank Setup and DAO Costs

8.5.2 Use of Public Raise

As the approval for the bank licence draws closer, Valhalla Network will conduct a public sale, offering 200 million governance tokens to raise €55 million. Almost all of the amount raised during the public sale will be added to the anchor bank's CET1 capital, thereby providing the necessary capital for the Phase 1 bank to commence its operations. Roughly €5m will be used to provide dex liquidity.

The Public Sale will be facilitated through an open subscription model and a launchpool, ensuring broad accessibility. When the public sale completes, the governance token will be listed on a decentralised exchange. After that is complete, all tokens sold during the public sale will unlock for exchange.

Use of Public Raise	Assigned Funds (€)
Tier 1 Equity	50,000,000
Dex Liquidity	5,000,000

Table 5: Use of Public Raise

9 Roadmap / Plan

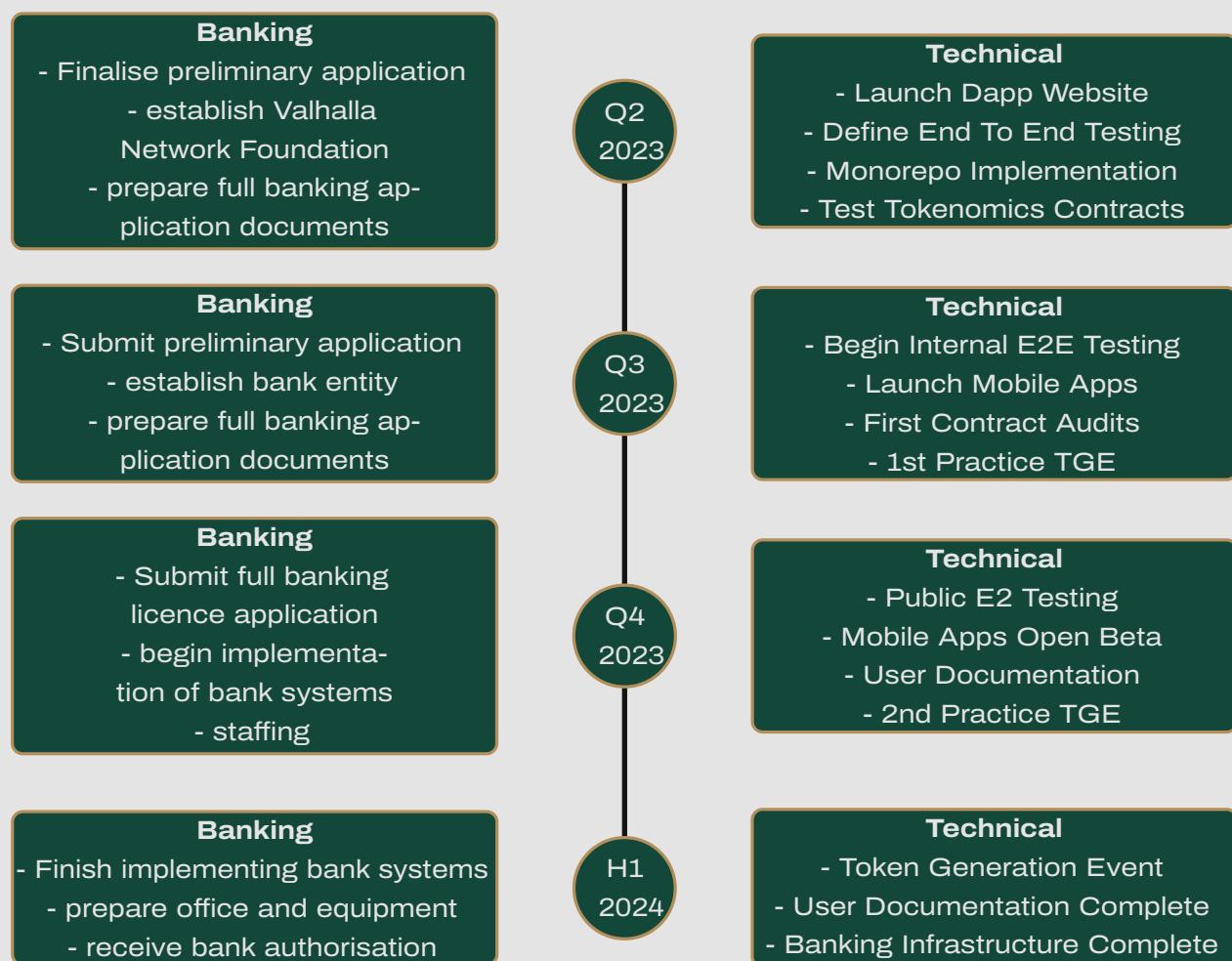
High-level overview to date

Banking Application: The team used the majority of 2022 researching and exploring different regulatory environments suitable for establishing both the Foundation and the anchor bank. Various factors were taken into consideration including jurisdiction and regulator reputation,

time and cost involved, and the ease of doing business. Deciding on the right jurisdiction is critical to the overall success of the project. Through the end of 2022 to Q2 2023, the team finished preparing preliminary application documentation and drafted the Foundation Articles of Association and bylaws.

Technical Development: Due to the banking timeline, the project has the luxury of an extended technical runway versus the majority of web3 start-ups. This provided us the time to complete thorough research into the requirements of the MVP and define its foundations before starting implementation. Towards the end of 2022, the technical team implemented a full governance system of integrated applications, allowing users to propose, vote, and execute governance changes that resulted on-chain; Valhalla Network's provisional test token, VNT, was used to weight votes. The design of Valhalla Network's token economy was fully completed in Q1 2023 moving the technical team to the deployment phase and stress testing.

Valhalla Network Timeline



10 Team

Valhalla Network's overall responsibility is to deliver on the plan quickly but meticulously to bring value to Valhalla Network's community and wider stakeholders. Responsibility for the overall success of the project lies with the CEO who will work together with the Project Chair and banking team to prepare and establish the anchor bank. Responsibility for the successful delivery of the technical solution lies with the CTO.

The day-to-day operations of banks within the network will be the responsibility of experienced senior management who will be headhunted, interviewed, and hired by Valhalla Network's executive team.

10.1 Executive Team



Prof. Richard A. Werner
Project Chair



Oliver Studd
CEO



Audie Sheridan
CTO



Borja Clavero
Bank Project Manager



Mark Jolly
Head of Compliance



Mark Mottershead
VP Marketing



Zoe West
Business Development

10.2 Advisors



Andreas Neukirch
Former CFO & COO
of GLS Bank



Iain Mackinnon
FCO Regulated,
MD of IFM&Co



Alex MacDonald-Vitale
MD of Titan Advisory



Matt Gubba
FCO Regulated,
MD of BizBritain



Shafeeq Qureshi
MD of Sollix Consulting



Theodor Beutel
DAO Governance
Advisory

Appendices

A Who is Prof. Richard Werner?

Prof. Richard Werner is an internationally renowned economist and professor of international banking and economics. Werner holds a doctorate in Economics from the University of Oxford and a First-Class Honours B.Sc. in Economics from the London School of Economics.

In 1992, Werner proposed the disaggregation of credit and its impact on asset markets and economic growth with his 'Quantity Theory of Credit'. Three years later, he hit headlines by advancing the concept of 'quantitative easing' in Japan, defining it as an expansion in credit creation. His work was published in the leading daily newspaper, the Nikkei, on 2 September 1995.

Alongside inventing 'quantitative easing', Werner authored the No. 1 bestseller book, 'Princes of the Yen', in which he unveils the secrets of central bankers and sheds light on the startling reality of Japan's 1990s recession. The accompanying YouTube documentary, 'Princes of the Yen,' has garnered nearly 4 million views, showcasing the widespread interest in his work.

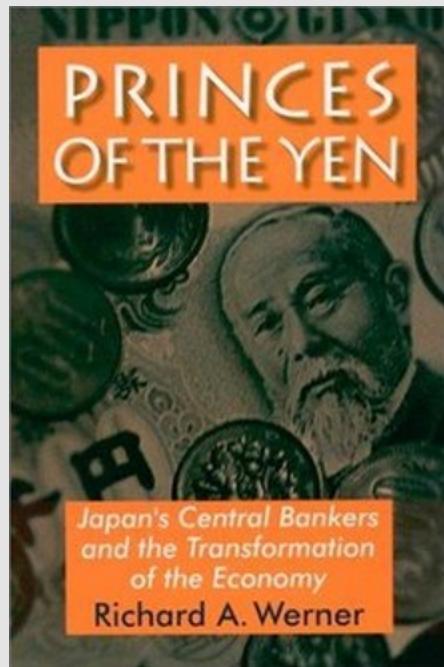


Figure 11: Caption of the image

In 2003, Werner warned of the coming creation of credit bubbles and the forthcoming banking

crises in the eurozone. In 2005, Werner released his second book, ‘New Paradigm in Macroeconomics’, in which he further warned of upcoming banking crises.

In 2014, Richard published the first empirical proof in the history of banking that banks create money out of nothing when they grant a loan. Richard’s paper ‘Can banks individually create money out of nothing?’ has revolutionised economists’ understanding of the mechanics of the monetary system and provided practical policy recommendations.

For over a decade, Richard has been actively involved in the establishment of community banks, to enhance local economies and empower communities. Remarkably, the birthplace of these community banks aligns with his own roots in Bavaria, Germany. Drawing upon his extensive expertise in banking and economics, Richard’s engagement has brought forth solutions to bolster the role of community banks as engines of economic growth and stability at the grassroots level.

Throughout his career, Prof. Richard Werner’s research, publications, and policy recommendations have significantly influenced the understanding of banking, monetary policy, and economic growth. His pioneering work continues to be highly regarded and applied in academic and policy circles worldwide.

B The Financial System

Valhalla Network is a reaction to banking systems that fail the people and businesses who need them the most. We build our mission around the idea that banking can do better, but to understand what that means requires understanding what the modern, consolidated, too-big-to-fail banks are doing wrong. Banks are often found acting unethically, laundering money, and requiring government bailouts, and they are rarely held accountable. The pseudo-government central banks that regulate banks have power that isn't always clear, doesn't seem to make things better, and is never communicated well. In this section, we'll explain and prove why banks that act locally and engage with small and medium sized enterprises (SMEs) do a better job than overly large multinational banks. Valhalla Network. This section is the result of research that drives Valhalla Network's mission.

Many people misunderstand how banks work and the impact they have on economies. Even bankers at the largest commercial banks naively believe banks to be simply financial intermediaries, only moving money between 'depositors' and 'borrowers' to make profit on the net interest margin. This perceived role would make banks no different from non-bank financial institutions (such as investment firms). Banks are different.

Banks are crucial for the vibrant growth of economies and survival of businesses. When banks extend loans they act as credit creators, and subsequently, when borrowers repay loans, banks act as credit destroyers. This process of credit creation fuels the economy, and when done responsibly, results in GDP growth. In contrast, when non-bank financial institutions (firms without a banking licence that loan funds to borrowers) lend to businesses, the 'investment' cancels out private consumption 1:1 resulting in zero GDP growth. This is similar to governments borrowing from private investors to fund their fiscal policy; by borrowing from private investors, government spending is cancelled out by reduced consumption. There is no credit creation in these two cases as only a bank can create new credit - banks create money out of thin air.

B.1 The Importance of Small and Medium-Sized Enterprises (SMEs) – SMEs' Economic Role

Today's globalised economies often seem dominated by large corporations, but this is far from true. In the European Union (EU), small and medium-sized enterprises (SMEs) with less than 250 employees:

- constitute 99.8% of all firms
- employ 75.2% of the labour force
- contribute to 53% of the gross value added of the total economy

The "typical European firm is a micro firm" ?. Other countries are similar. In most OECD countries, SMEs account for 30–70 percent of value added, 15-50 percent of exports, 60–70 percent of

employment, and a disproportionately large share of new jobs?.

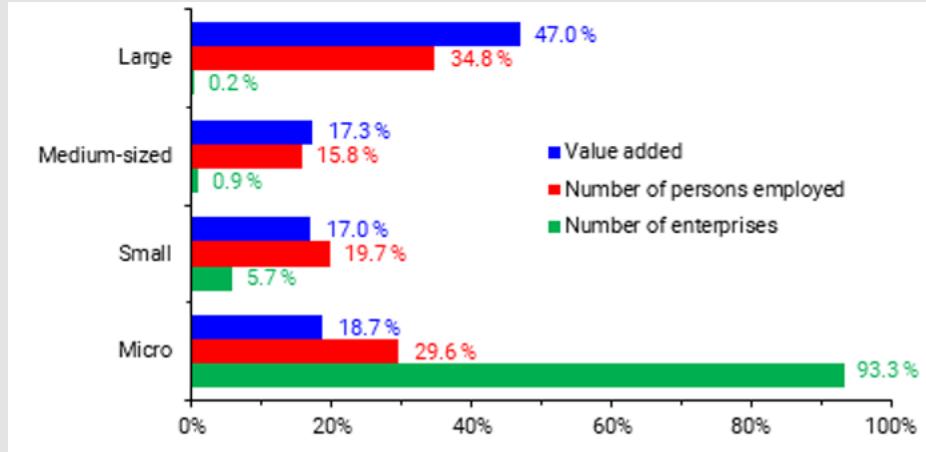


Figure 12: Share of large, medium, small and micro firms in value added, employment and number of enterprises. Data refers to EU27. Source: ICW, SME Performance Review 2021.

Perhaps most strikingly, SMEs are the biggest net job creators. According to the International Labour Office?, young enterprises, especially young SMEs, “create a disproportionately high number of jobs”. The report refers to SMEs creating more jobs than warranted by looking at their share of employment. And not only do they create more jobs, they also destroy fewer jobs. SMEs are therefore strong net job creators.

The report adds that:

“Although young enterprises respond more strongly to economic upturns or downturns than old enterprises, they remained net job creators during the Great Recession of 2007–09. Most of the job losses were caused by contractions of mature businesses”

(ibid., p. 9)

The following figure is taken from that same report.

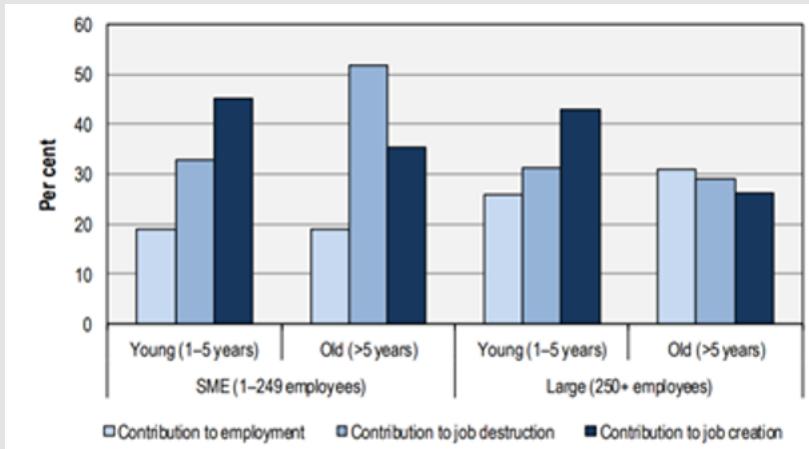


Figure 13: Employment, job creation and destruction by enterprise age and size. OECD sample (2001–2011). Source: International Labour Office (2015, p. 10, Fig. 2.6). CITATION HERE

Also, “young enterprises are less likely to survive than older enterprises, but the surviving young enterprises tend to have higher employment growth rates.” (De Kok et al., 2011, p. 8). The second effect outweighs the first. Furthermore, fast-growing SMEs provide the bulk of job creation.⁴

	Net job creation per 1,000,000 population
Newly born enterprises	17.5
Young enterprises	0.2
Established enterprises	-4.2

Table 6: Net job creation 2004–2010 by age group of enterprises that survived. Source: De Kok et al. (2011, p. 8). Based on Amadeus/Orbis, Bureau Van Dijk.

B.2 SMEs Depend on Banks

Getting external funding is not easy for SMEs. This is for various reasons. Unlike large firms, SMEs cannot access regulated capital markets at an affordable cost, for fees are much higher for small denomination issues (European Parliament, 2019, p. 2).⁵ Being unable to access capital

⁴Enterprises mostly start as micro or small enterprises but might grow to become large enterprises. Few start-ups (2–9 per cent) grow above ten employees, but they make a substantial contribution to job creation, ranging from 19 to 54 percent. It is ultimately only a few enterprises that grow to become larger enterprises and generate most of the new jobs. These high-growth enterprises are often referred to as transformational entrepreneurs, graduate enterprises or gazelles, and they create vibrant businesses with jobs and income for others, beyond the scope of an individual's subsistence needs. In contrast, subsistence entrepreneurs usually do not grow, but provide income and employment for the owner of the micro-enterprise and his or her family (International Labour Office, 2015, p. 10).

⁵In the EU, companies wishing to raise capital on public markets through the issuance of shares or bonds have a choice between two broad categories of venues: regulated markets and multilateral trading facilities. Even though both categories are open to companies of all types and sizes, regulated markets have compliance requirements that render listing costlier and cumbersome for smaller firms (European Parliament, 2019, p. 2).

markets, SMEs turn to banks as their only alternative for external funding of substantial amounts (SMEs tend to borrow from family and friends, but the amounts tend to be smaller, naturally) (OECD, 2018, p. 10). But banks, like most lenders, typically ask for collateral to reduce the loss given default of the borrower (it is estimated that around 50–70% of loans to non-financial firms are collateralised), but unlike larger firms, SMEs often do not have good quality collateral to offer (Degryse, Karapetyan and Karmakar, 2019, p. 1; Beck et al., 2015). Banks prefer to deal with larger firms (OECD, 2018, p. 6; Brown and Lee, 2014, p. 9). To compensate for this, banks tend to charge SMEs higher interest rates (OECD, 2018, p. 8)⁶ compared to large firms with better collateral or a longer credit history or a credit rating, and SME loan applications are more frequently rejected (European Commission, 2009).⁷

The next two figures tell this story visually using data for euro area banks and SMEs. As shown below, small firms (which are part of the SME sector) tend to be charged a higher interest rate compared to large firms, tend to cite access to finance as their most pressing problem more commonly, their loan applications get rejected more often, and when they get accepted, they tend to get everything they ask for less frequently.

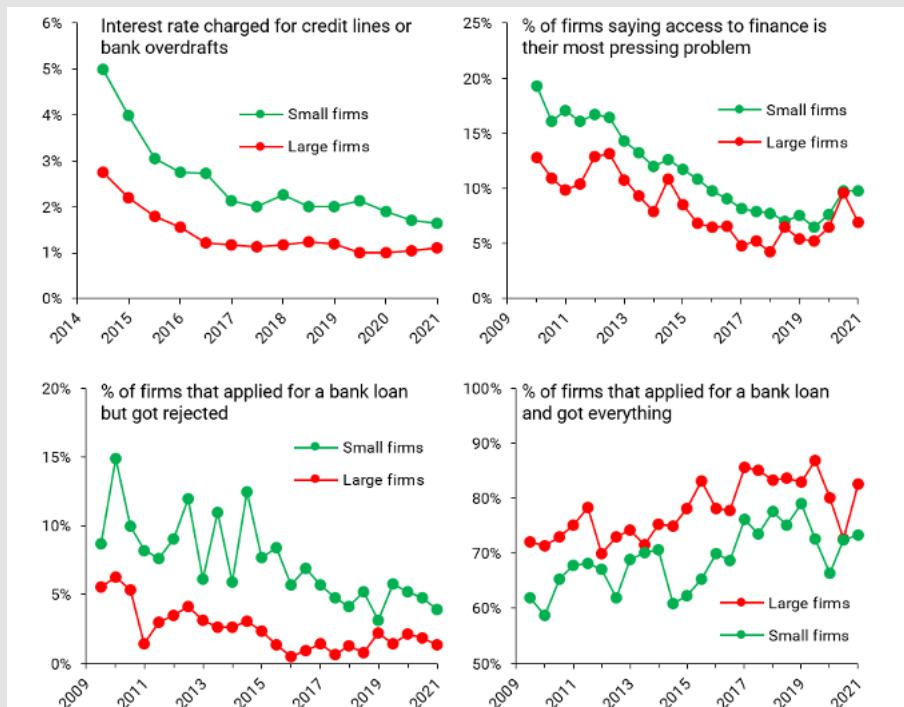


Figure 14: Source: ECB Statistical Data Warehouse, Survey on Access to Finance of Enterprises (SAFE). CITATION HERE

Consistent with the above description, even though SMEs cite insufficient collateral, high interest

⁶In the OECD countries, in 2008, the median interest rate charged to SMEs was 15.5% higher than the rate charged to large enterprises, whereas in 2016, that percentage had more than doubled, standing at 32.7% (OECD, 2018, p. 8).

⁷In 2009, for instance, only 5.2% of loan applications were rejected among large firms, that share was double for small firms and even three times as large among micro-businesses (European Commission, 2009)

rates and lack of availability of willing lenders among their reasons for not asking banks for borrowed money relative to larger firms, fewer SMEs of those that do not seek bank funding say they do so because they do not need it. This is shown in the next figure.

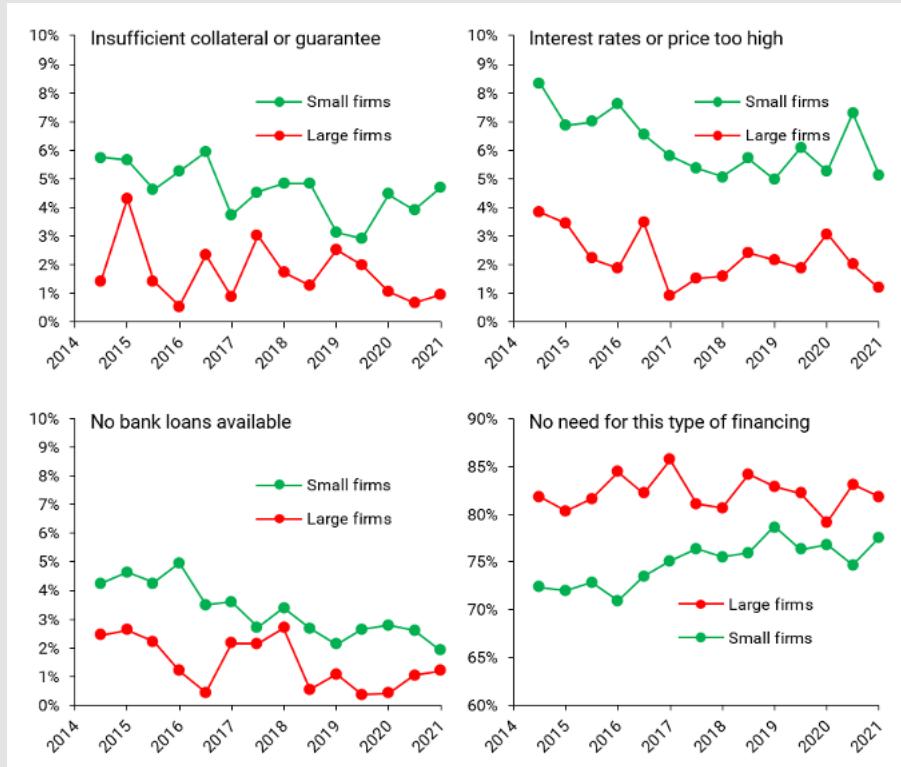


Figure 15: Most important reason why bank loans are not relevant. Source: ECB Statistical Data Warehouse, Survey on Access to Finance of Enterprises (SAFE). CITATION HERE

The next figure paints the same picture. Despite the fact that SMEs are reliant on bank loans to a higher extent than larger firms, the unattractive terms at which banks agree to lend to them result in SMEs applying less for loans and therefore receiving less loans relative to larger firms. Many SMEs are known to be discouraged, and some of them never attempt to borrow from banks in the first place. Evidence from the US suggests that borrower discouragement is prevalent across SMEs (Levenson and Willard, 2000; Han et al., 2009), and younger and smaller firms are much more likely to be discouraged borrowers (Han et al., 2009).

To compensate for this, SMEs tend to rely more on bank overdrafts, credit card debt and, less commonly, on grants and subsidised loans, as in the recent Covid-19 crisis.

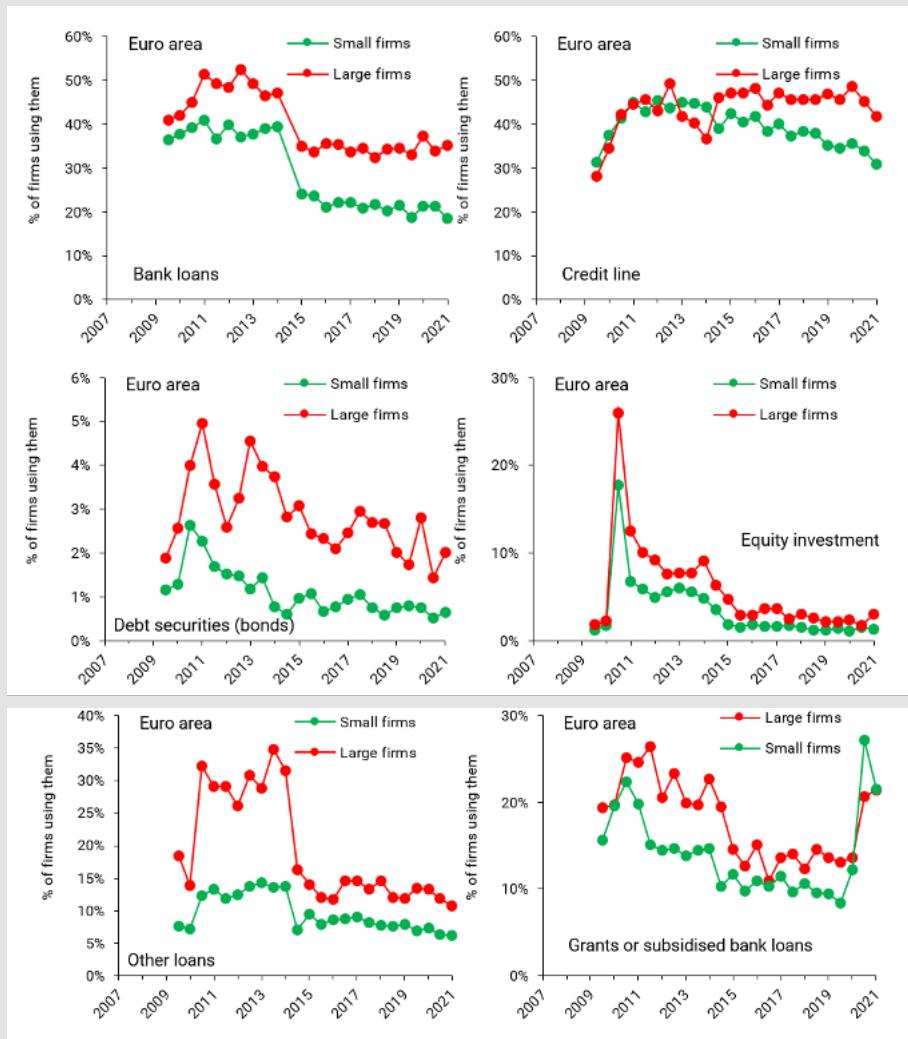


Figure 16: Sources of financing used. Source: ECB Statistical Data Warehouse, Survey on Access to Finance of Enterprises (SAFE). CITATION HERE

The Covid-19 crisis showed quite presciently the extent to which SMEs are dependent on bank loans. When governments introduced loan guarantees, SMEs were the main beneficiaries and users, as shown below.

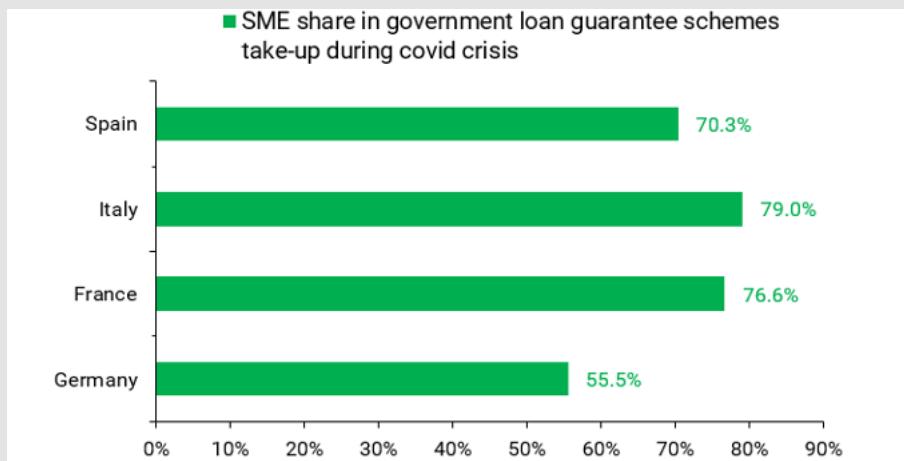


Figure 17: Source: ECB (2021), Financial Stability Review, May 2021.

All in all, these data tell us that SMEs have a hard time accessing external funding, they are heavily reliant on bank lending, and when their loan applications are accepted, the terms of the loan contract are generally less advantageous compared to larger borrowers.

B.3 Large Banks Do Not Serve SMEs

There is a rule in banking: *big banks prefer to do big deals with big customers*. Thus, it is small banks which tend to extend small loans to small businesses, as shown by the work of Prof. Richard Werner (see graph below). Consequently, when small banks disappear (due to mergers, closure, etc.), SMEs find it harder to obtain funding from big banks, which prefer to deal with bigger customers.

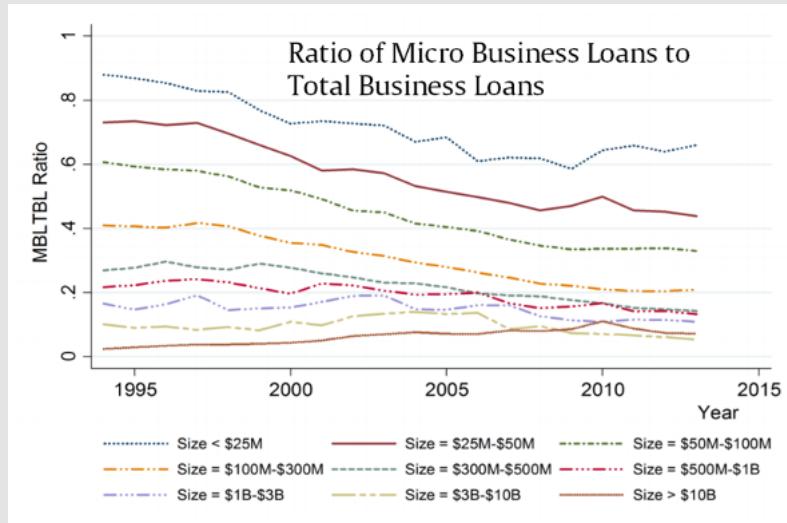


Figure 18: This graph illustrates the actual behaviour of bank lending to micro businesses over time for U.S banks. Each line represents the lending propensity of each of nine bank size groups over the period from 1994 to 2013.
Source: Mkhaiber and Werner (2021).

The next figure uses data for Swiss banks to show the same pattern. Loans to companies with less than 10 employees in Switzerland account for a higher share of the balance sheet of smaller banks relative to that of bigger banks. The reverse is true with regards to loans to non-SMEs (i.e., firms with more than 250 employees).

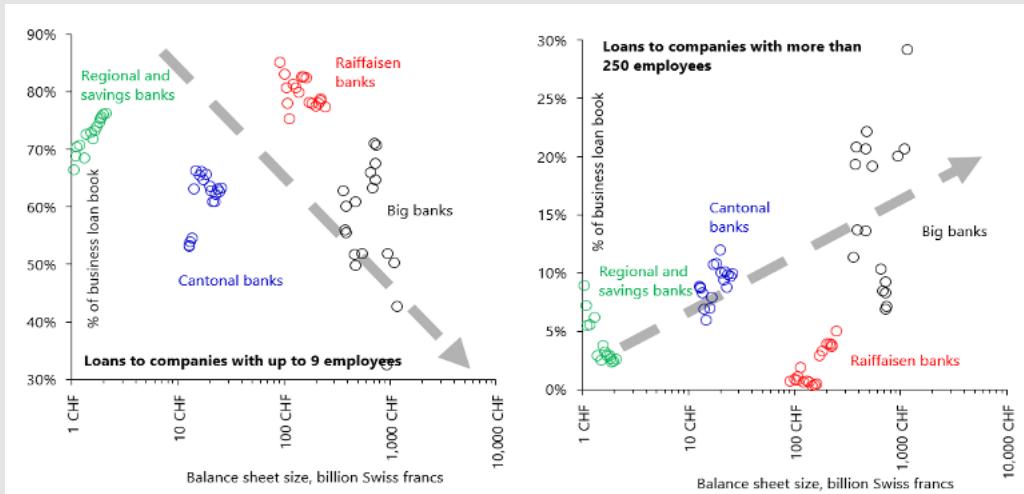


Figure 19: Vertical axis: share of loans to micro-companies (with less than 10 employees) in Switzerland as a percentage of the total balance sheet by type of bank. Data for banks resident in Switzerland. Horizontal axis: balance sheet of the banks. Source: Swiss National Bank. CITATION NEEDED

The USA provides an interesting case. Since the mid-1980s, the number of community banks

has fallen dramatically, from 15,661 in 1984 to 4,825 in 2019 (a staggering 69% drop in 35 years). As shown below, there is a clear correlation between the share of loans of “small” denomination (loans with principal < \$100,000) in total loans and the community banks’ share in total commercial and industrial (C&I) loans, suggesting that community banks are the primary lenders of small-denomination loans, not surprisingly. Naturally, SMEs are the most likely borrowers of these loans. Incidentally, large-denomination loans (those with principal >\$1,000,000) tend to be 3 times more volatile.

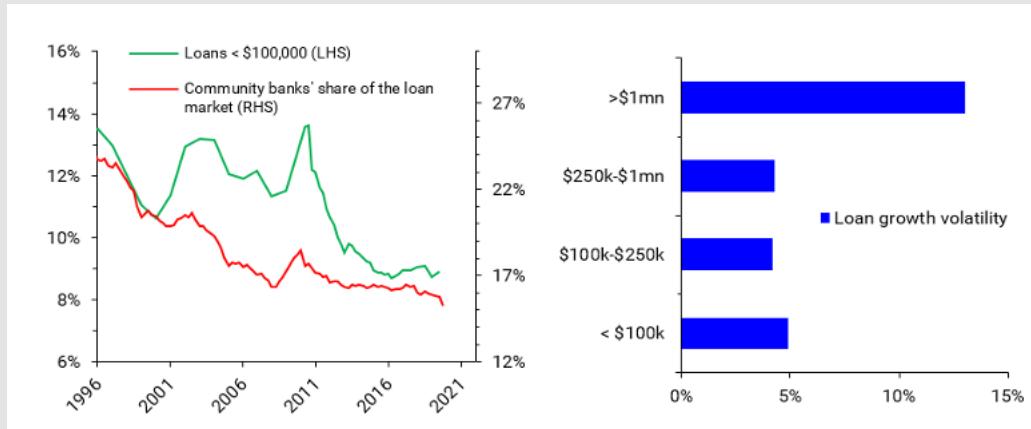


Figure 20: Market share of community banks in total bank lending in the US (green) and the share of commercial and industrial (C&I) loans of denominations below US\$1MM in total C&I loans (blue). Source: FDIC CITATION NEEDED

The following figures show some correlations of banking concentration and various variables of relevance related to SME borrowing. As can be seen, in a more concentrated banking system (measured as the share of the biggest banks in total assets), relative to bigger firms, SMEs tend to apply less for bank loans, their loan applications get rejected more often, and they get charged higher interest rates.

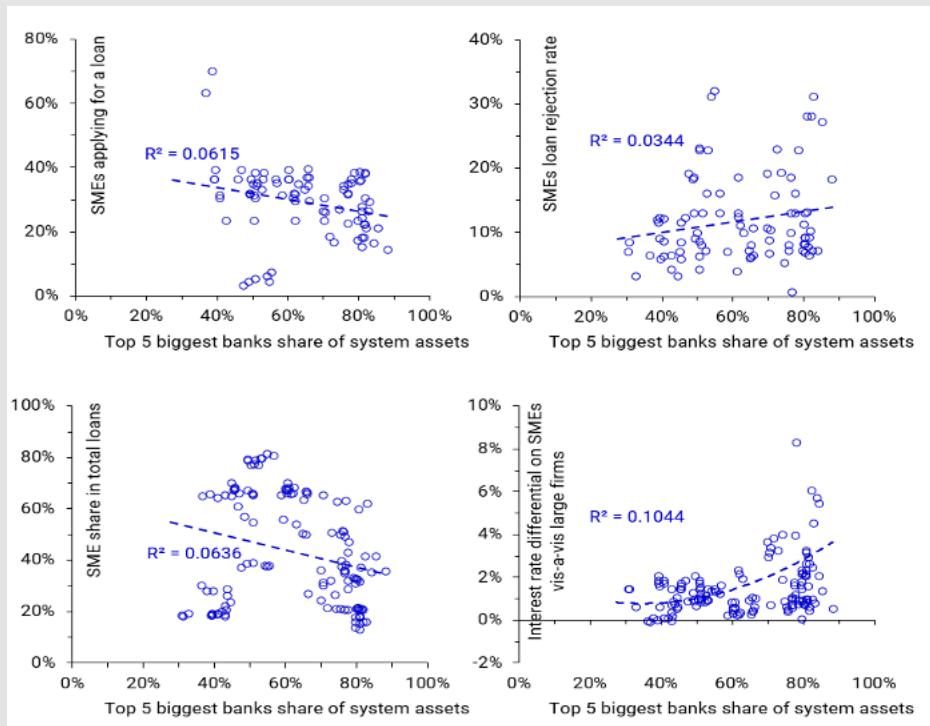


Figure 21: Data are for 15 OECD countries, 2007–2016 (source: OECD.Stat, Financing SMEs and Entrepreneurs: An OECD Scoreboard), and 45 countries, 2006–2017 (source: World Bank (2019), Global Financial Development Database). Complementary sources: BIS, SME Finance Forum. CITATION NEEDED

What about that sub-sample of SMEs that is considered the most competitive, the so-called “hidden champions”, which are those SME firms that rank on the top-3 in terms of global market share in their market niches? The data here also support the view that small banks are critical for their success. The figure below shows that there is a considerable correlation between the number of banks and the number of hidden champions, both measured in per capita terms.

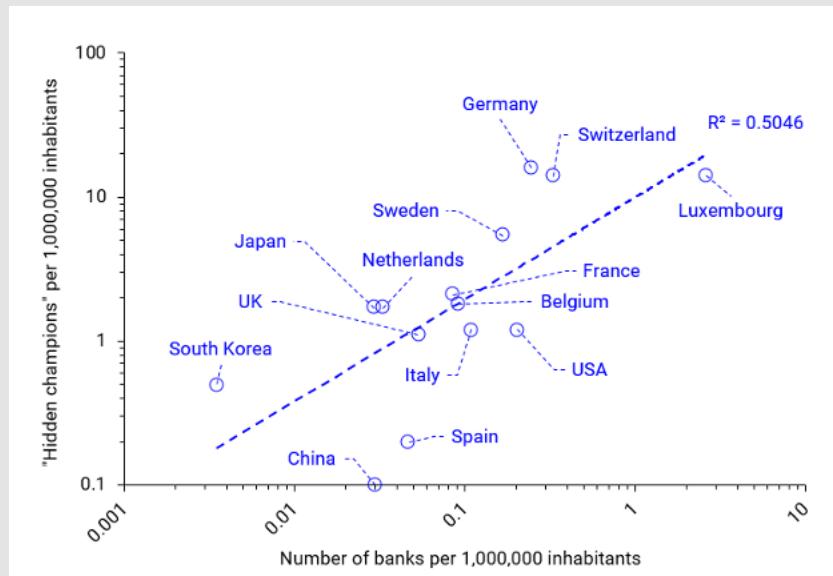


Figure 22: Data are for 2014. Source: Simon, Kucher & Partners; Bank of International Settlements. CITATION NEEDED

The case of Germany is illuminating. As of 2014, it was the country with the highest number of hidden champions, both in absolute terms (1,300+) and per capita (16 per 1,000,000 residents). German export competitiveness is widely known. Less known is the fact that Germany is home to some 1,500+ banks (the highest number in Europe). Around 70% of these banks are locally-controlled, small, community banks.⁸ These small banks lend to local SMEs, which account for a large bulk of German exports.

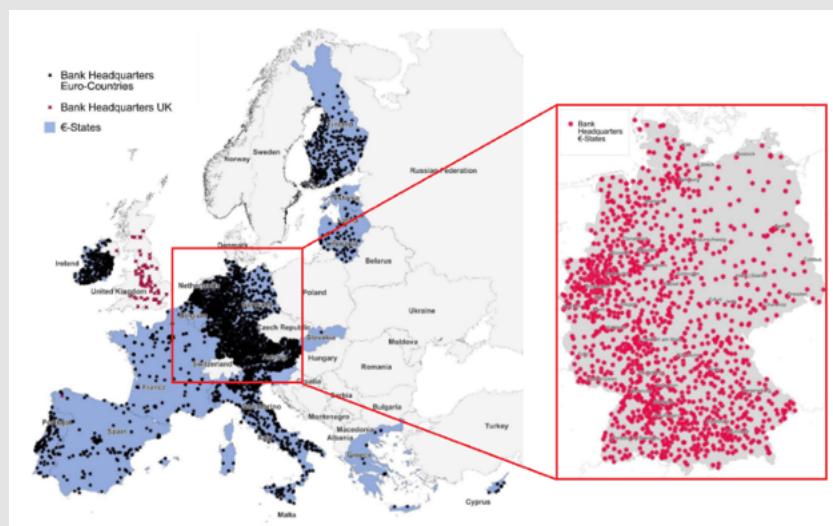


Figure 23: Gärtner and Fernandez-Montoto (2018) CITATION NEEDED

⁸See <https://foe.scot/wp-content/uploads/2012/05/Edinburgh-Werner-Case-for-Local-Banks-2012.pdf>

The following figure compares the geography of German-based bank headquarters and German hidden champions. The similarities are striking.

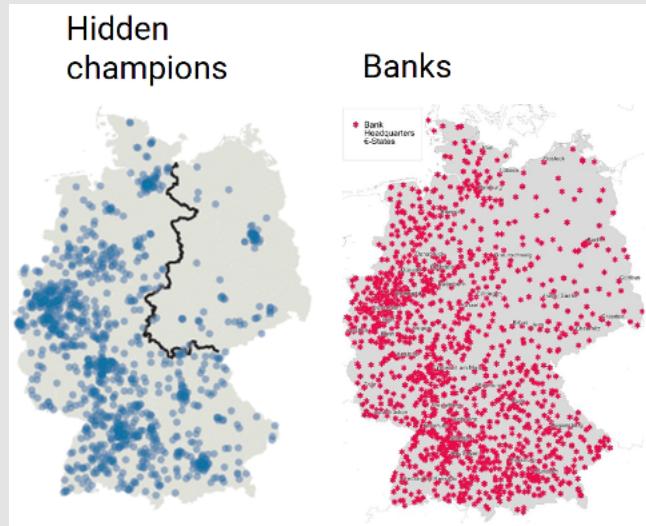


Figure 24: Left: The Economist (2019). Right: Gärtner and Fernandez-Montoto (2018) CITATION NEEDED

... and banking system concentration is increasing in most countries

Sadly, banking systems across the world are only getting *more and more concentrated*. The following figure shows data for 28 EU countries. The various indicators of concentration (the share in total assets of the biggest 5 banks, the Herfindahl-Hirschman Index (HHI) for assets and credit) have consistently increased in the period of 1997-2017.⁹

⁹The Herfindahl-Hirschman Index (HHI) is a common measure of market concentration and is used to determine market competitiveness. The higher HHI, the higher the concentration.

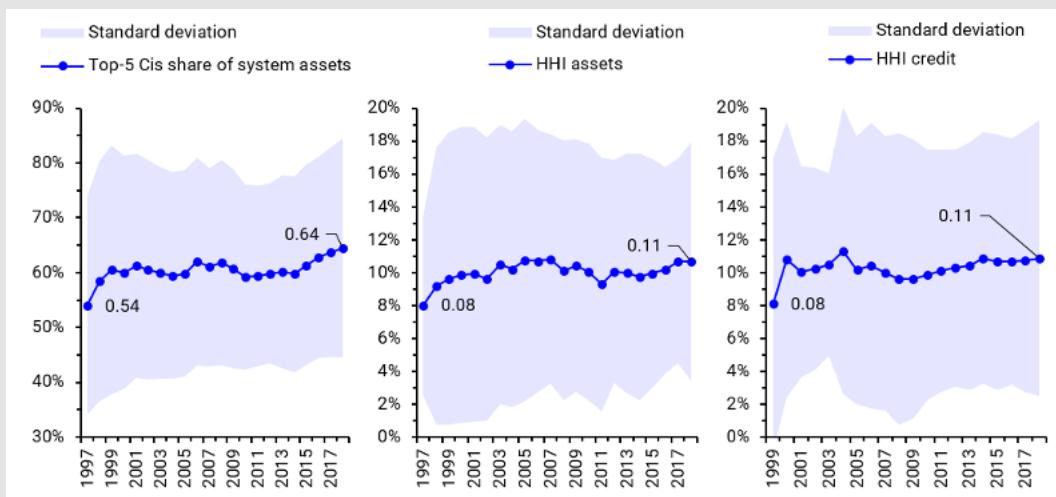


Figure 25: Left: Share of biggest 5 credit institutions in system assets. Middle: Herfindahl-Hirschman Index (HHI) for credit institution assets. Right: HHI for credit institutions' credit. Data for 28 EU countries including the UK. Source: ECB Statistical Data Warehouse, Structural financial indicators.

This can be seen also by looking at the number of banks. With the exception of Ireland, the number of banks in European countries has registered a steady decline throughout the last two decades. The following figure shows the total number of credit institutions in the European Union. *If the trend continues, by mid-century there will be less than 100 banks left in the EU.*

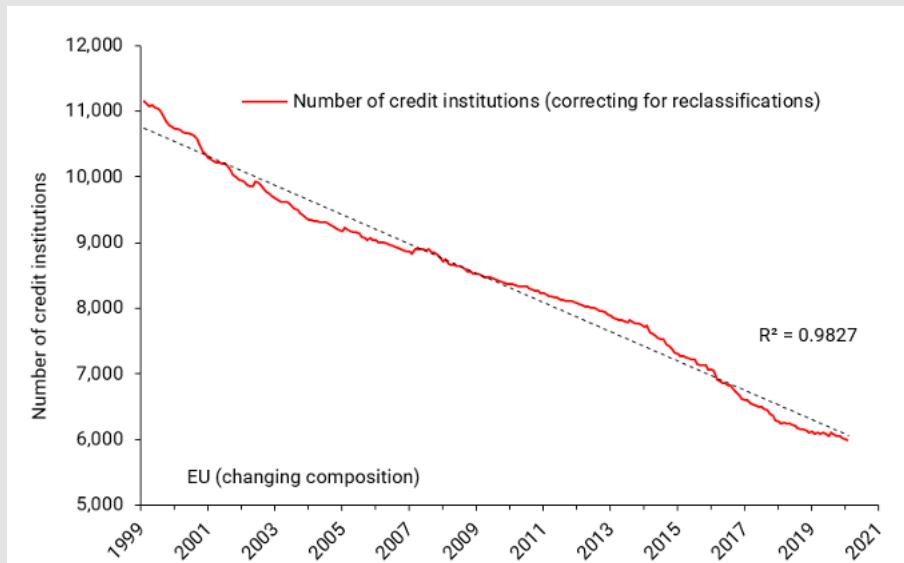


Figure 26: Source: ECB Statistical Data Warehouse, List of financial institutions, <https://sdw.ecb.europa.eu/browse.do?node=9691593>

The following figure shows data on the number of banks in absolute and per capita terms for a

number of advanced countries in a shorter time span, 2005 to 2015. As can be seen, with the exception of Australia, Mexico and a few others, the number of banks has decreased across the board, sometimes dramatically as in the case of China.

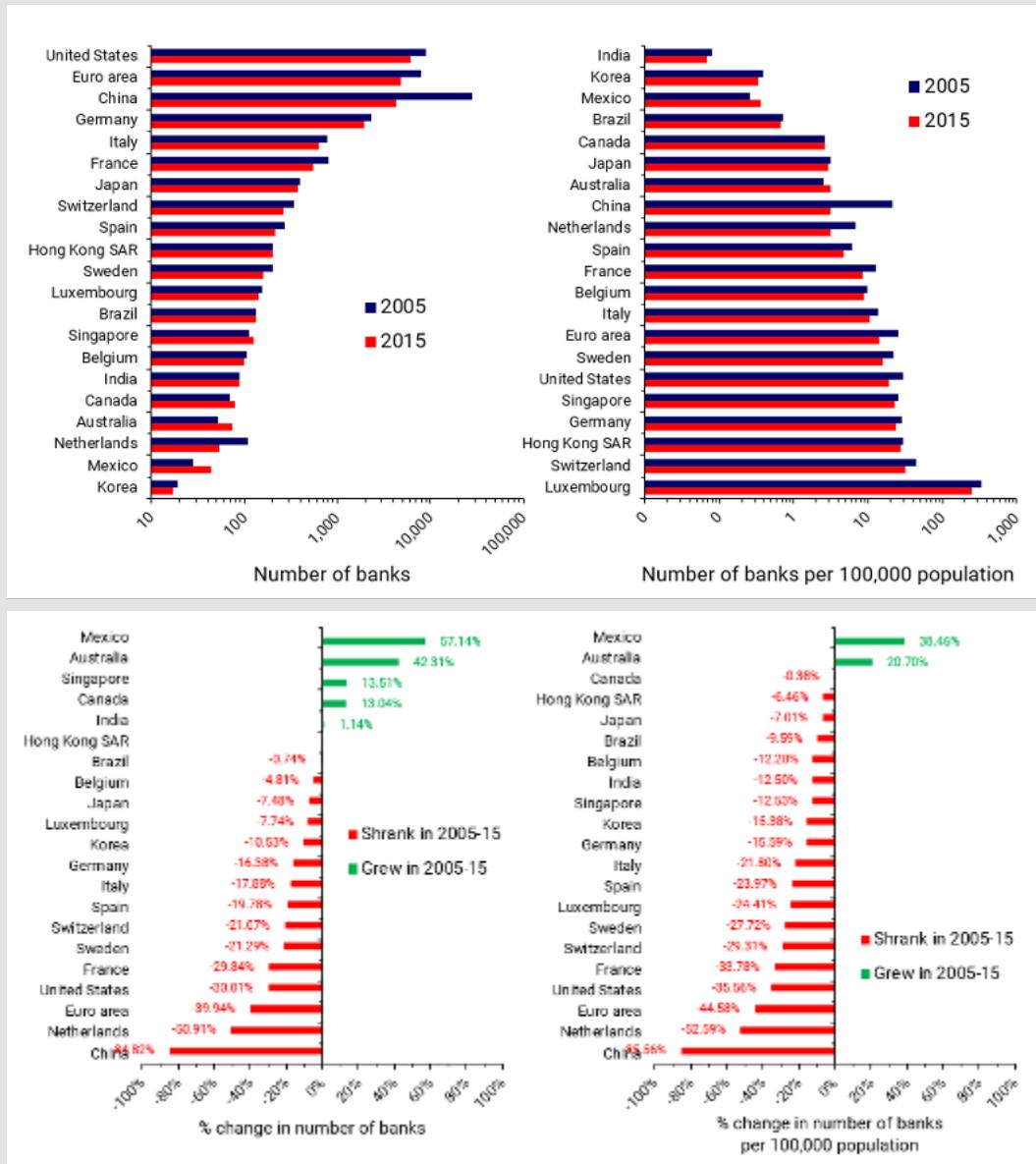


Figure 27: Source: ECB Statistical Data Warehouse, List of financial institutions, <https://sdw.ecb.europa.eu/browse.do?node=9691593>

Although there may be multifarious reasons for the decline, we can point to the relative disadvantage smaller banks have in terms of compliance costs. As shown below, smaller banks tend to lack the economies of scale of bigger banks, and compliance costs represent a higher percentage of their non-interest expenses (up to 4 times).

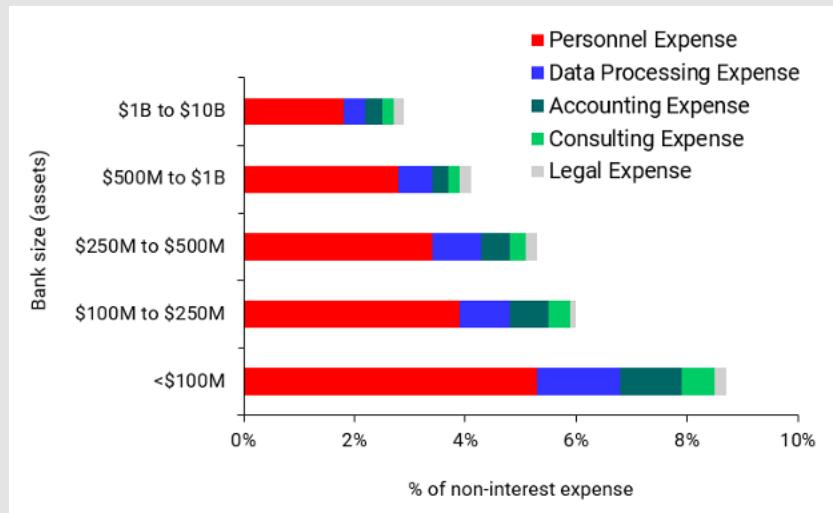


Figure 28: Sample consists of 469 U.S. banks. Source: Dahl and Meyer (2016)

Note that the data of the previous figure are for the USA, where there are a different set of regulations for small and big banks. In the EU, authorities mandate that all banks adhere to the same regulations (i.e., Basel III/IV, etc.), regardless of their size.

The following table shows the cost of compliance as a percentage of assets for a sample of 251 EU banks. An even more dramatic result emerges: for smaller banks, compliance costs are on average 25 times that of large banks (1.0%) might not seem like a lot, but remember that banks have return-on-assets in the range of 0.1-0.4%).

	Number of Banks	Average
SNCI	163	1.03%
Medium	49	0.56%
Large	39	0.04%
All Institutions	251	0.79%

Table 7: Compliance costs in percent of total assets (average across 2018-2020). SNCI stands for Small and Non-Complex Institutions. Source: EBA (2021, p. 72)

Sometimes in economic policy circles, this reduction in the number of banks is considered a positive development, and the argument that “there are too many banks” can sometimes be heard. This cannot possibly be true if we take a historical perspective. If we go back to the 1700s, we see that the number of banks today is already close to historical minima (more so in per capita terms), and one would have to go to the late-19th century in the case of the USA and Italy, and to the mid-18th century in the case of the UK, to find a comparable figure.

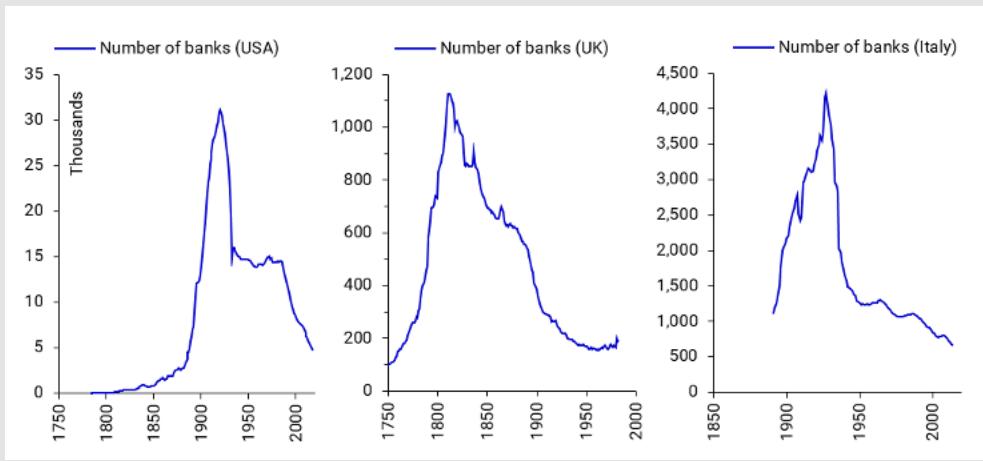


Figure 29: The number of banks in the USA, UK and Italy. Sources: Mitchie, Bank of England, British Bankers Association, Weber (2006), Fohlin and Jaremski (2019), FDIC.

B.4 Large Banks Lend for the Wrong Reasons

Bank lending for speculative purposes creates banking crises and recessions, bank lending for consumption creates consumer price inflation, and bank lending for capital formation creates economic growth

For centuries, it was thought that for an economy to grow, the amount of money in circulation ought to increase proportionally. This was the famous “quantity theory of money”, also called the “equation of exchange”. This equation, linked together with the “real economy” (Y) (what we today call real Gross Domestic Product or GDP), the price level (P), with the amount of money (M), which circulated with certain velocity (V).

For a while, this relationship worked well empirically, and the data seemed to suggest the equation was valid, which meant that velocity V was relatively constant, and the link between money M and the real economy Y was understood: more money, more economic activity.

In the 1970s, however, the equation began to break down, and velocity V no longer seemed stable; it actually fell substantially during the 1970s through the 1980s across industrialised countries. As Charles Goodhart, a prominent UK monetary economist put it:

“The equation came apart at the seams during the course of the 1980s”

Goodhart, 1989

In other words, the link between money and the economy was no longer a reliable one. The economics profession reacted by capitulation and dropped money altogether from virtually all

economic models (the infamous DSGE models that failed to forecast the 2008 crisis) (Wieland V & Wolters M, 2012).

During the 1990s, a series of papers by Werner (1992, 1997) appeared that showed that the equation was still valid, it only had to be adapted to our modern banking system. Werner performed two operations to the quantity equation:

- Replace money (M) with bank credit (Cb)
- Divide the money stream into two: money that goes into the real economy (CRb), like loans for SMEs, and money that goes into speculation and unproductive uses (CFb), like real estate and investment funds.

The replacement of money (M) by bank credit (Cb) can be done because, as several central banks and dozens of economists now recognise, banks create money when they grant loans. The Bank of England, for example, explains in a 2014 paper that:

"When banks make loans, they create additional deposits for those that have borrowed ... Banks making loans and consumers repaying them are the most significant ways in which bank deposits are created and destroyed in the modern economy"

Bank of England, 2014

More recently, the Bundesbank stated that:

"In fact, book money is created as a result of an accounting entry: when a bank grants a loan, it posts the associated credit entry for the customer as a sight deposit by the latter and therefore as a liability on the liability side of its own balance sheet. This refutes a popular misconception that banks act simply as intermediaries"

Bundesbank, 2017

According to the UK's most prominent monetary economist, Charles Goodhart, this new view "is now taking over as the consensus approach" (Goodhart, 2017).

In a landmark experiment, Richard Werner (2014a) performed an empirical test on a small German bank in lower Bavaria, the Raiffeisenbank Wildenberg e.G. The test consisted in borrowing €200,000 from the bank and recording all the internal transactions that the bank registered in its IT accounting system. The test showed without a doubt that the bank created the money when it extended the loan. No money was transferred from other accounts inside or outside the bank. The money was created "out of nothing."

In other words, unlike non-bank firms, banks *create money when they lend to households, firms and governments*. They do so by crediting the borrower's account, as a simple double-entry book-keeping exercise.

The next figure shows the structural difference between the mechanics of bank lending and non-bank lending.

Non-bank lender		Borrower		
	Assets	Liabilities		
Deposits	-£1mn		+£1mn	
Loans	+£1mn		+£1mn	
Bank				
	Assets	Liabilities		
Deposits		+£1mn	+£1mn	
Loans	+£1mn		+£1mn	

		Money transfer
		Money creation

Figure 30: Mechanics of lending by non-banks (top) and banks (bottom).

Thus, the quantity theory of money can be turned into two separate equations:

$$C^b V = C_R^b V_R + C_F^b V_F \quad (1)$$

$$PQ = P_R Q_R + P_F Q_F \quad (2)$$

The next step in Werner's logic was to equate the first pair of variables and the second pair of variables, so that:

$$C_F^b V_F = P_F Q_F + P_F A \quad (3)$$

And:

$$\text{With } V_F = P_F A / C_F^b \text{ constant} \quad (4)$$

Applying the chain rule for differences (that is, $\Delta(ab) = a\Delta b + b\Delta a$). With a constant, $\Delta(ab) = a\Delta b$ which, when applied to stocks, represent flows:

$$\Delta P_R Y = \Delta nGDP = \Delta C_R^b V_R \quad (5)$$

$$\Delta P_F A = \Delta C_F^b V_F \quad (6)$$

Finally, using year-over-year relative growth rates:

$$\Delta nGDP/nGDP = \Delta C_R^b / C_R^b \quad (7)$$

$$\Delta P_F A / P_F A = \Delta C_F^b / C_F^b \quad (8)$$

The quantity theory of money turned into a new theory: the quantity theory of disaggregated credit (QTDC). It has two predictions:

- Equation (??): the economy grows if bank lending for the real economy grows
- Equation (??): asset bubbles are caused by non-productive bank lending

Since it was formulated in the 1990s by Werner, other scholars have put the theory to test with successful results.¹⁰ Virtually all of the papers found that bank lending to the real economy, measured in various ways, was the only statistically significant variable explaining nominal GDP growth.

The next figure shows estimates by Werner (1997) for the Japanese economy during the 1980s and 1990s. The left panel shows the first prediction of the theory, namely, that nominal GDP growth ought to be caused by bank credit for GDP transactions. The right panel shows the second prediction: asset bubbles (in this case land prices) are caused by bank credit to real estate.

The econometric tests performed by Werner confirmed the predictions, but we can see by visual inspection that the theory is very plausible.

¹⁰The QTDC was tested in Japan by Werner (1992, 1993, 1994, 1997), it was later applied to the Czech Republic (Bezemer and Werner, 2009), the UK (Lyonnet and Werner, 2012; Ryan-Collins, Werner and Castle, 2016), Spain (Werner, 2014c; Bermejo-Carbonell and Werner, 2018), Germany (Kusin and Schobert, 2014), and Japan later again (Werner, 2005, 2012; Voutsinas and Werner, 2011b).

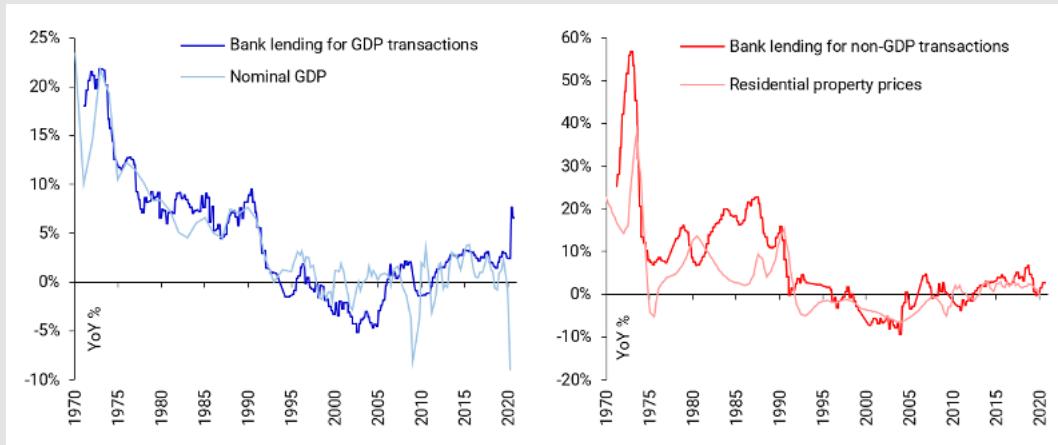


Figure 31: Source: Werner (1997), Bank of Japan.

The next two panels use data for the euro area.

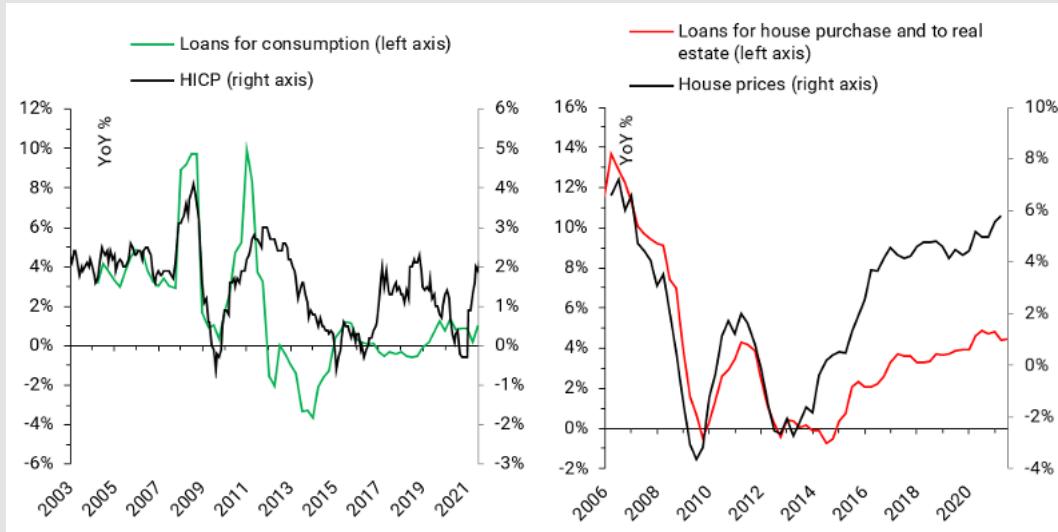


Figure 32: Left panel: bank loans for consumption and consumer price inflation, measured as the annual change in the Harmonised Index of Consumer Prices (HICP). Right panel: bank loans for house purchase and to real estate-related businesses, and house prices. Source: ECB Statistical Data Warehouse; author's calculations. <https://sdw.ecb.europa.eu/>

In the area of banking and macroeconomics, Richard Werner's quantity theory of credit stands as the empirically most successful theory. The theory has far-reaching implications:

1. The economy can only grow if banks lend for activities that contribute to GDP This includes lending to firms that will invest (I) in machinery, R&D, staff training, acquisition of fixed assets, etc.; lending to governments (G) who will spend in paying civil servants and infrastructure

projects, and lending to households for consumption (C).

$$GDP = C + I + G + NX \quad (9)$$

2. Asset bubbles can be prevented This can be done by redirecting bank lending away from mortgages and lending to other financial institutions, to lending to non-financial firms.
3. Only lending to the real economy is sustainable For every pound in new debt created by bank loans to the real economy, there is a one-pound increase in national income (GDP). Therefore, the debt is sustainable and can be serviced and repaid. GDP grows in tandem with debt, and debt-to-GDP levels stay constant. Bank lending to non-GDP activities, on the other hand, increases debt but does not increase GDP. It leads to ever-higher debt-to-GDP ratios which create crises, recessions and debt overhangs that stifle growth. They also decrease house affordability and increase inequality through capital gains.
4. Lending for consumption can create inflation. Lending for investment in machinery, equipment, R&D, etc., is less inflationary If more money chases a fixed amount of goods and services, it is more likely that this will result in inflation than if lending is directed at investment, which will expand the productive capacity of the economy and thus increase demand as well as supply of goods and services.
5. Small banks can have big effects Unlike non-bank financial intermediaries like investment funds, bank lending creates money, and if fed adequately to the economy (through GDP expenditures), it can make whole communities and regions grow in a sustainable way. Furthermore, SMEs are the biggest employer in most countries, and they are the backbone of any economy. As mentioned, a dramatic case in point is provided by German SMEs: well-served by the thousands of small, not-for-profit community banks, these SMEs can access funding to grow. In fact, during the 2008-09 recession, unlike the big German banks, the small banks increased lending to their SME customers when they most needed it. Germany has the highest number of “hidden champions”, more than any other country in the world. These firms are world leaders in their niche markets in terms of market share, and they contribute substantially to Germany’s 8%-odd trade surplus.

From the perspective of the quantity theory of disaggregated credit, the composition of the loan book of European banks looks far from desirable. The next figure breaks down euro area bank lending into different sectors and according to whether the funds are used by borrowers for capital formation (e.g., machinery, R&D), consumption, or speculation (all non-GDP transactions, e.g., acquisition of financial assets, of existing real estate assets) (in the previous equations, capital formation and consumption are part of CR_b, and speculation is part of CF_b).

As can be seen, as of Q2 2021, only 27.85% of bank lending is directed at capital formation, 18.3% is directed at consumption, both of which contribute to economic growth, although only the former creates real (inflation-adjusted) GDP growth.惊异的是, 53.85% of bank loans are for speculative purposes, mainly the acquisition of existing houses which, as mentioned, translates into higher house prices but does not contribute to GDP growth.

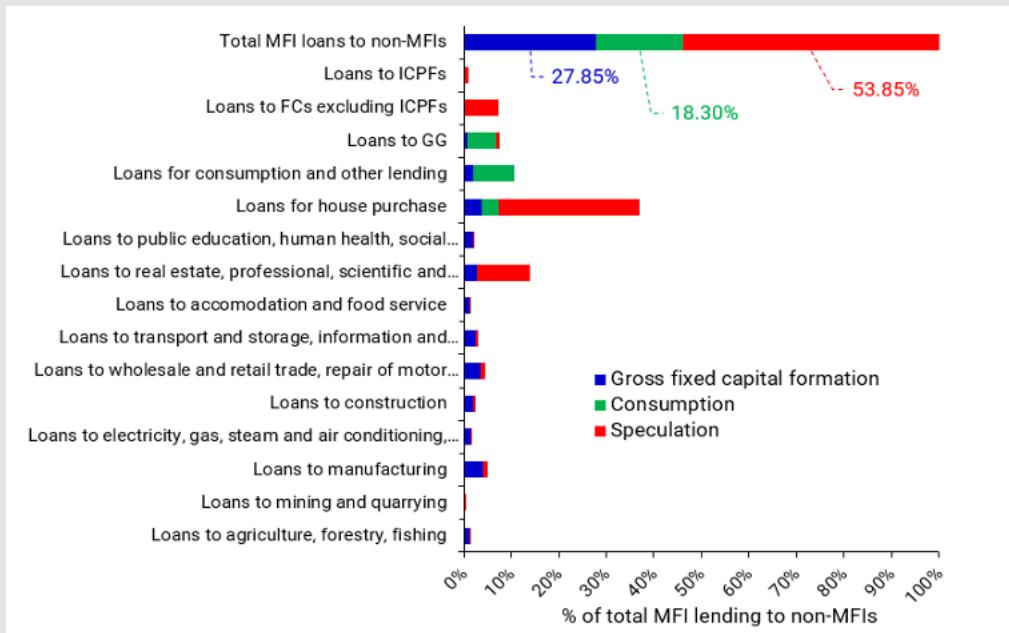


Figure 33: Source: ECB Statistical Data Warehouse.

Worse still, the share of speculative loans in total loans has only increased in the last 17 years.

B.5 Concentrated Banking Speculates and Holds Less Capital

Finally, as shown in the figure below, there is some evidence that more concentrated banking systems go hand-in-hand with a higher share of mortgages in total bank loans, and a lower share of business loans. They also tend to hold more bonds (typically government bonds, which fund mostly consumption and to a lesser extent capital formation), have less capital, and are more profitable.

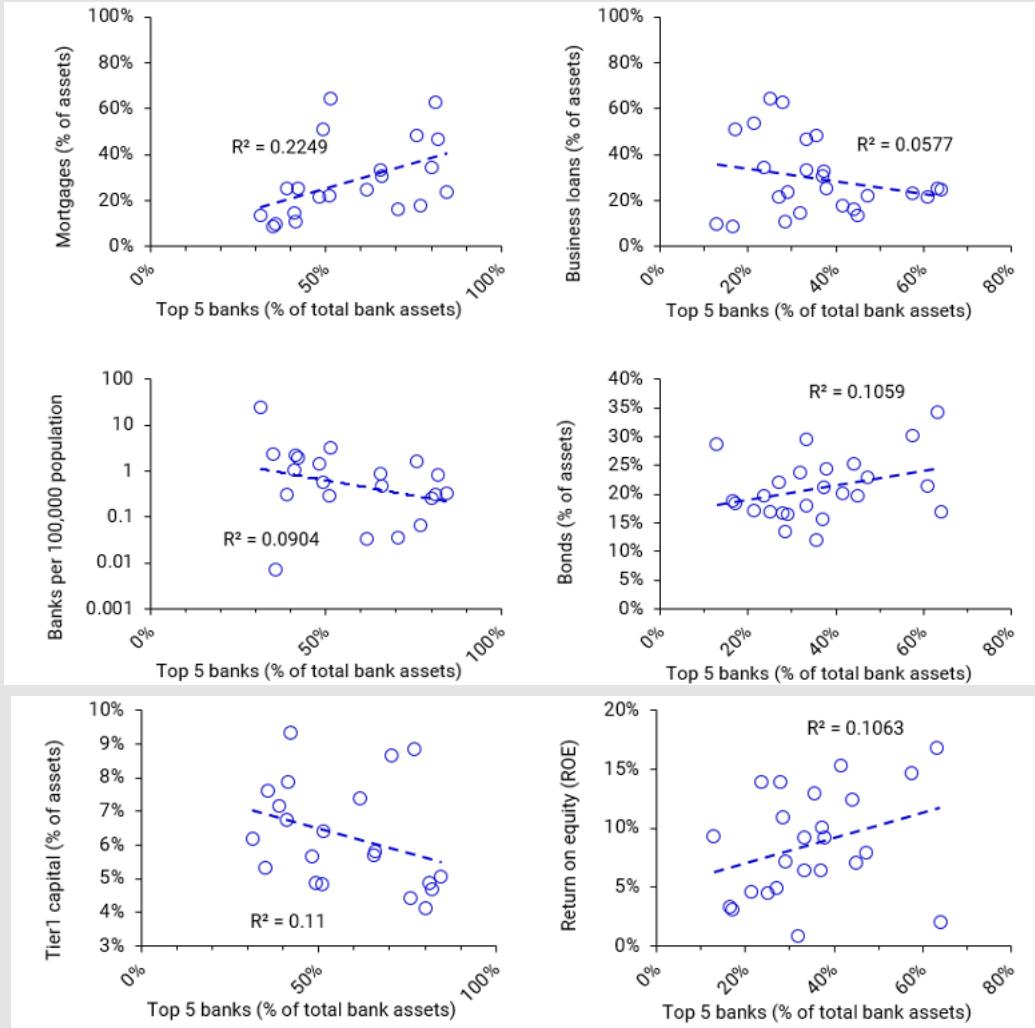


Figure 34: Data are for 2015. Source: BIS banking structure data.

B.6 Summary of the Financial System

In particular for net job creation, it is evident that SMEs are crucial for any economy. Despite their heavy dependence on banks for their main source of external funding, SMEs are usually charged higher interest rates and struggle to access necessary finance from their banking provider. SMEs are subject to ever increasing stress as banking systems are universally becoming more concentrated with fewer banks operating. Empirical data shows that the remaining banks are becoming more speculative and increasing the share of mortgages on their balance sheets; this behaviour contributes little to economic prosperity and, in fact, engulfs economies in banking crises and deep recessions.

Community banks foster a more robust and resilient economy, and enable SMEs to thrive.

Evidence shows that as the number of banks per capita increases, the number of successful SMEs or “hidden champions” per capita increases with them. Valhalla Network will democratise finance and create these healthy economies.

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