TALLINN UNIVERSITY OF TECHNOLOGY
DOCTORAL THESIS
36/2026

Navigating Informality and Innovation: Entrepreneurial Adaptation and Strategies in Post-Soviet Kazakhstan and Kyrgyzstan

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TAL TECH PRESS

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This dissertation was accepted for the defence of the degree 21/05/2026

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Declaration:
Hereby I declare that this doctoral thesis, my original investigation and achievement, submitted for the doctoral degree at Tallinn University of Technology has not been submitted for doctoral or equivalent academic degree.

TOMMASO AGUZZI

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ISSN 2585-6898 (publication)
ISBN 978-9916-80-511-4 (publication)
ISSN 2585-6901 (PDF)
ISBN 978-9916-80-512-1 (PDF)

TALLINNA TEHNIKAÜLIKOOL
DOKTORITÖÖ
36/2026

Mitteformaalne majandus ja innovatsioon: ettevõtluse kohanemine ja strateegiad postsovetlikus Kasahstanis ja Kõrgõzstanis

TOMMASO AGUZZI

TAL TECH
KIRJASTUS

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List of Publications

The list of author's publications, on the basis of which the thesis has been prepared:

I Polese, A., Moisé, G.M., Tokyzhanova, T., Aguzzi, T., Kerikmäe, T., Sagynbaeva, A., Sauka, A. and Seliverstova, O. (2023). Informality versus shadow economy: reflecting on the first results of a manager's survey in Kyrgyzstan. Central Asian Survey, 42(1), 149-170. DOI: https://doi.org/10.1080/02634937.2022.2093328

II Aguzzi, T., Ianole-Calin, R., & Durst, S. (2024). Are small-and medium-sized enterprises more likely to innovate when facing informal competition? Evidence from Kazakhstan. International Journal of Sociology and Social Policy, 44(5/6), 499-515. DOI: https://doi.org/10.1108/IJSSP-11-2023-0303

III Aguzzi, T. (2024). Digitalizing Micro-Business in Times of Disruption: Insight into Innovative Strategies in the Kazakh Economy. In: S. Durst & A. Pevkur (Eds.), DIGITAL TRANSFORMATION FOR ENTREPRENEURSHIP (chapter 12, pp. 195-213). World Scientific Publishing, Singapore, DOI: https://doi.org/10.1142/9789811270178_0012

Other publications:

IV Polese, A., Tokyzhanova, T., Moise, G., **Aguzzi, T.**, Kerikmäe, T., Sagynbaeva, A., Sauka, A., Seliverstova, O., Lysa, O. and Kussaiynkyzy, A., (2023). Why Shadow Economy and Informality Should Be Separated As Concepts: Results and Implications of the Shadow Economy Survey in The Post-Soviet Region. Studia Politica: Romanian Political Science Review, 23(1).

V **Aguzzi, T.**, (2024). Kelin (Central Asia). In A. Ledeneva, E. Teague, P. Matijevic, G. M. Moisé, P. Majda, and M. Toqmadi (Eds.), The Global Encyclopaedia of Informality, Volume 3: A hitchhiker's guide to informal problem-solving in human life (pp. 517–558). UCL Press.

Author's Contribution to the Publications

Contribution to the papers in this thesis are:

I Polese et al. (2023). Co-Author: Problematization, literature review, analysis, discussion, and paper write-up.

II Aguzzi et al. (2024). Lead author: Problematization, literature review, data collection and analysis, discussion, and paper write-up.

III Aguzzi (2024). Author: Problematization, literature review, data collection and analysis, discussion, and paper write-up

Introduction

"A lot of goods come to Kazakhstan unofficially, as if they are falling from the sky," remarked a tax accountant I interviewed in Almaty. "There are countless entrepreneurs who do not keep any accounting records at all—they also issue unofficial receipts, which we call tickets." His account captures the everyday realities of Kazakhstan's informal economy, where unofficial trade and off-the-books transactions are normalized rather than exceptional. Working with dozens of small entrepreneurs, he described a system in which informality is not a marginal deviation from the rules, but an integral part of entrepreneurial life. This raises a central question: how does such pervasive informality affect entrepreneurs' ability to innovate, and how can we reconceptualize informality's role in entrepreneurial adaptation? In this context, entrepreneurs repurpose Soviet-era warehouses or shipping containers into shops, rely on WhatsApp groups for coordinating supply, keep debt books to register regular customers' transactions, and seal business deals not with formal contracts but through trust, reputation, and reciprocity (Spector and Botoeva, 2022). These practices have been described by several authors not simply as relics of an incomplete transition from a planned economy; rather, as responses to institutional ambiguity, market volatility, and scarce resources (Alff, 2015; Baitas, 2022; Fehlings and Karrar, 2022; Spector, 2017).

These adaptive practices define the entrepreneurial landscape examined in this thesis and are used to question dominant understandings of what constitutes the informal economy and how it shapes entrepreneurs' business activities in Kazakhstan and Kyrgyzstan. Conventional wisdom might view these as residuals of incomplete modernization; however, this thesis argues that these informal activities constitute an institutional order in their own right—a web of norms, networks, and practices that coordinates exchange when formal rules are thin, distrusted, or selectively enforced (Ault and Spicer, 2022; Williams and Nadin, 2014). According to Kumar (2021), informal entrepreneurs blend what Scott (1998) calls *metis*—contextual, practical, flexible know-how—with *techne*—universal, technical, codified knowledge. In markets where formal and informal firms "share the market", this order and the presence of pervasive informal competition is ambivalent for innovation: it constrains by compressing profit margins and limiting access to formal finance, yet it can also catalyse differentiation, resource recombination and rapid digital adoption, especially under disruptions such as the COVID-19 pandemic. In contrast to traditional views of informality as a drag on development, this research specifies the conditions under which informality can catalyse innovation and adaptation.

The informal economy refers broadly to economic activities outside official regulation (ILO, 2018). In the literature, the informal economy is often described as the "hidden" (Chan et al., 2023), "underground" (Williams, 2006) or "shadow"

economy (Medina and Schneider, 2021). As Banks et al. (2020) argue, the very adjectives typically used to describe the informal economy establish a hierarchy in which formality is framed as the normal, secure and regulated standard, while informality is constructed as its marginal, deviant and inferior "other." This hierarchy is not neutral, but is produced through regulatory and policy processes at both the state and international levels, which define, govern, and promote the boundary between what counts as "formal" and "informal" (Mesa, 2024; Kiaga and Leung, 2020). Nonetheless, the informal economy remains a pervasive global phenomenon, commonly associated with weak institutional quality and state capacity, complex tax and regulatory systems, the absence of strong legal and enforcement mechanisms, and pervasive corruption (Chen and Carré, 2020)—conditions that erode tax morale and, in turn, increase incentives to participate in informal economic activities (Asllani and Schneider, 2025; ILO, 2022; World Bank, 2023). Drawing on Dell'Anno (2022) and following the International Labour Organization (ILO) definition (2018), this thesis understands the informal economy as comprising economic activities and transactions that are concealed from the authorities in order to avoid taxation, social security contributions, or labour regulations. Such activities may be illegal in the sense that they violate administrative, fiscal, or labour law requirements, but they are not necessarily criminal in the sense of involving inherently illicit goods, services, or acts such as trafficking, fraud, or other forms of organised crime. In this thesis, the term informality refers specifically to firm-level economic practices that circumvent taxation, labour regulations or registration requirements, while remaining socially tolerated. This includes unregistered businesses, informal employment arrangements or envelope wages—that is, wages partly or fully paid off the books and not declared to the authorities—, and income underreporting which, although technically illegal, are widely perceived as legitimate (Dell'Anno, 2022) and socially acceptable (Webb et al., 2009), allowing entrepreneurs and consumers to pursue opportunities beyond formal institutional boundaries (Salvi et al., 2023; Webb et al., 2009; Williams and Bezeredi, 2018). Throughout the thesis, informality is thus understood as these 'grey-zone' business practices, rather than fully criminal activities involving inherently illicit goods, services, or acts, such as drug trafficking, smuggling, or organised fraud. The boundary between formal and informal entrepreneurial activity is fluid, shaped by unregistered operations (Williams and Kedir, 2018), informal hiring (Williams, 2025), and unrecorded transactions (Aguilar et al., 2025), as well as by varying degrees of compliance with tax and labour laws (Horodnic et al., 2022; Darbi et al., 2018).

Crucially, the state is not treated here as a passive background regulator, but as an active constitutive force in defining what counts as formality through registration regimes, labour regulation, taxation, inspection practices, and the selective enforcement of rules. At the same time, the legal status of an activity and its degree of social acceptance should not be collapsed into one another:

state-imposed legal norms and locally shared norms of legitimacy may diverge, and it is precisely this divergence that helps explain why certain practices remain formally illegal yet socially normalised in everyday market life (Helmke and Levitsky, 2012; Suchman, 1995; Williams et al., 2015). In this thesis, entrepreneurial adaptation is understood as the situated process through which entrepreneurs reconfigure products, processes, market channels, and compliance arrangements in response to institutional uncertainty, competitive pressure, and technological change.

In an economy where formal and informal activities coexist, this thesis understands an entrepreneur—following Shane and Venkataraman (2007)—as an individual who identifies, evaluates and exploits opportunities under uncertainty by mobilising resources to create and capture value. In policy and management studies, entrepreneurial activity is often implicitly equated with fully formal ventures, legally constituted firms that are registered with the relevant authorities and compliant with tax, licensing and labour-regulation requirements (Darbi et al., 2018; ILO, 2021, Marušić et al., 2020). In this thesis, informal entrepreneurs are still entrepreneurs in this opportunity-based sense, but they do so wholly or partly outside these statutory requirements. Informal entrepreneurship (IE) therefore refers to the pursuit of otherwise legal goods and services through practices such as unregistered trading, cash-only sales or off-the-books employment—activities that are technically illegal yet often perceived as legitimate or acceptable within their communities (Salvi et al., 2023; Williams and Bezeredi, 2018; Webb et al., 2020; Simba et al., 2023). Therefore, the entrepreneurs concerned navigate institutional voids, high compliance costs or state inefficiencies by blending formal and informal practices along a continuum; their ventures may be temporary, seasonal or strategically hybrid, and can move toward or away from formalisation as incentives, risks or capabilities change (Williams, 2021). Thus, throughout the thesis, "entrepreneur" denotes actors who discover and exploit opportunities, whether they operate within formal rules or in the grey zones of informality; the formal–informal divide is treated as a dimension of how they organise their activity, not as a boundary of who qualifies as an entrepreneur.

Although IE has often been portrayed as the shadow of development or the antithesis of modernization in orthodox literature (De Soto, 1989; ILO, 2018; Williams, 2023) and institutional approach literature (Fotié and Mbratana, 2024; Granados & Rosli, 2018), IE is the prevailing mode of economic life for a large portion of the world's population (Elgin et al., 2021; ILO, 2022; Huang et al., 2020; Ohnsorge and Yu, 2022).

Consequently, it has been argued by scholar such as Simba et al. (2023) that IE should be recognised as a legitimate and often vital engine of development in both advanced and developing economies—complementary to, and not inferior

to, formal entrepreneurship. Additionally, Aluko et al. (2019) contend that for many individuals, IE is a stepping-stone that enables opportunity identification, recognition, and exploitation.
Globally, nearly half of all workers—around two billion people—are engaged in informal employment (OECD, 2024), and up to 90 percent of micro and small enterprises operate outside the full reach of formal regulation, collectively accounting for a substantial share of global GDP (Bosma et al., 2021; ILO, 2023; Medina & Schneider, 2018).

In the post-Soviet region, and particularly in Central Asia, the informal sector has remained both resilient (Turaeva and Urinboyev, 2021) and structurally embedded (Rudaz, 2017). In Kazakhstan and Kyrgyzstan, the focal countries of this thesis, informality has averaged around 38–39 percent of GDP throughout the post-independence period and continues to account for roughly 30 percent of economic activity today (Medina & Schneider, 2018). In Kazakhstan alone, an estimated 2.9 million out of 8.5 million workers are employed informally—many of them within officially registered firms that nonetheless rely on unrecorded transactions or uncontracted labour (Mussurov et al., 2019). In a recent survey, 36.4% of respondents reported participating in the shadow economy, primarily through work without a labour contract (16.6%), shadow entrepreneurship[1] (13.6%), and part-time unregistered work (6.2%) (Burkhanova et al., 2025). Moreover, nearly 40 percent of small and medium-sized enterprises (SMEs) identify informal competition as one of the main constraints on their business development (World Economics, 2023). These figures illustrate that the informal sector is not a peripheral feature of these Central Asian economies but a defining characteristic of their market systems. Something that has been described in literature as an enduring mode of coordination (Turaeva, 2018), adaptation (Van Assche and Hornidge, 2014), and survival in contexts of institutional uncertainty (Aliyev, 2015; Morris, 2019).

In post-Soviet Central Asia, informal marketplaces and bazaar networks (Spector, 2017) often operate as "frontiers of formality" where small and micro entrepreneurs combine registered and unregistered practices to launch and test new commercial initiatives beyond the state's direct reach (Karrar, 2019; Rudaz, 2022; Fehlings & Karrar, 2022). To analyse how informality shapes innovation, this thesis uses a broad but operational definition: innovation is the implementation/commercialisation of a new or significantly improved product/service or business process (Porter, 1990; OECD/Eurostat, 2018). This matters for micro-entrepreneurs and SMEs because innovation is not limited to high-tech R&D; it also includes new distribution channels, service formats, payment and delivery arrangements, or digitally enabled customer interaction. Even in developed economies, many innovative firms—especially SMEs—

[1] Terminology follows Burkhanova et al. (2025).

innovate through non-R&D activities (e.g., design, adoption, organisational and market changes) rather than in-house laboratories (Huang et al., 2010; Hervas-Oliver et al., 2011). In emerging and post-Soviet settings, where resource constraints and institutional gaps are typically sharper, innovation in micro and small businesses is therefore often incremental, adaptive, and frugal, relying on networks, recombination of available resources, and lightweight digital tools rather than formal R&D investment (Borchardt et al., 2021; Prasetyo et al., 2024).

In Kazakhstan and Kyrgyzstan, formal and informal actors contend within overlapping markets, targeting similar customers and often tapping the same supply networks. Crucially, they do so on an uneven playing field: informal firms enjoy cost advantages by evading taxes, licences and labour regulations, which allows them to operate more cheaply than their formal counterparts (Karrar, 2019). From the perspective of a compliant small entrepreneur in, say, Almaty or Bishkek[2], having to compete with vendors or service providers that do not report all their income to tax authorities can feel like unfair competition that undercuts prices and dishonestly attract customers. Indeed, empirical studies from international organisations (EIB, 2022; Ohnsorge and Yu, 2022) rank informal competitors among the biggest obstacles to doing business. However, operating informally also imposes important constraints. Informal firms often lack secure legal standing and are therefore more exposed to discretionary enforcement, corruption, eviction, and crime. They also face tighter financing constraints and greater uncertainty about survival, which shortens planning horizons and limits investment in growth. In this sense, the short-term cost advantages of informality are frequently offset by heightened vulnerability and weaker long-term prospects (La Porta and Shleifer, 2014).

The presence of a large informal sector can also constrain formal firms' growth opportunities: it may limit access to finance and information for formal businesses (Brancati et al., 2024), reduce their market share (Hlioui et al., 2022) and narrow strategic options (Mendi and Costamagna, 2017). Persistent informal competition pressure could also discourage formal entrepreneurs from investing in long-term innovation, if margins are low due to informal undercutting, spending on R&D or new product development might not seem the priority and impractical (Abbas et al., 2022). Thus, a prevailing assumption in the literature dealing with informality and innovation in SMEs has been that informal competition is a drag on innovation and formal sector development (Mendi and Costamagna, 2017, Kouakou, 2023).

Yet, emerging evidence suggests the relationship between informal competition and innovation in SMEs is more complex. Competitive pressure from informal businesses might also spur innovation as a defensive response (Aguirre

[2] respectively, Kazakhstan and Kyrgyzstan's largest cities.

et al., 2023; Hlioui et al., 2022). Firms facing agile, low-cost informal rivals could be driven to innovate in order to differentiate themselves (Dwibedy, 2022), improve efficiency (Farooq et al., 2022), or target new market niches that are harder for informal businesses to penetrate (Perez et al., 2019). In economic theory this is akin to an "escape-competition" effect: when faced with intense competition, firms innovate to escape direct price wars and create unique value (Aghion & Howitt, 1998). In other words, informality may act as a double-edged sword: on one side imposing constraints, but on the other side forcing entrepreneurs to become more creative and resilient in order to survive.

Most recently, the COVID-19 pandemic presented an additional shock for companies operating across formal and informal spheres, testing the adaptability of this informal-formal ecosystem (Narula, 2020; Webb et al., 2020). Lockdowns, mobility restrictions, and supply chain disruptions forced many businesses to temporarily close, drastically reduced revenue streams, and exposed their lack of resilience compared to larger firms with more resources (Gleason and Baizakova, 2020). According to OECD (2020), small businesses were disproportionately affected due to limited access to credit, smaller cash reserves and weaker infrastructures. In Kazakhstan and Kyrgyzstan, the situation was exacerbated by widespread informality and limited state capacity to deliver financial relief. Except for a temporary tax moratorium, many entrepreneurs – especially women, youth, and those in service sectors- were excluded from formal recovery programs, deepening economic vulnerability (ILO, 2021).

The pandemic and its consequence impacted enterprises around the globe by accelerating their digital transformation (Amankwah-Amoah et al., 2021), introducing new ways of communication, interaction, operation (Leonardi, 2020), and value creation (Klein and Todesco, 2021; OECD, 2021). Kazakhstan and Kyrgyzstan, which both imposed strict lockdowns and social distancing measures, saw micro and small enterprises (often operating semi-formally) suddenly cut off from face-to-face interactions, open-air markets, and traditional cash-based trade. Digital tools and platforms became lifelines for sustaining business during the pandemic in the region (Dyakonova and Karazhanova, 2021). Entrepreneurs rapidly moved sales to social media pages, used messaging apps like WhatsApp to take orders, and shifted to online payment and delivery systems (Bokayev and Issenova, 2022). These improvised digital strategies enabled many business owners to survive the crisis and, in some cases, even opened up new avenues for growth. For instance, Kazakhstan's e-commerce sector expanded fivefold between 2020 and 2024, as lockdowns and contact restrictions catalysed a massive shift toward online, contactless commerce. Authorities acknowledged that COVID-19 was a major accelerator for digital trade, with 2024 e-commerce volumes reaching 3.2 trillion Kazakh Tenge (KZT) (approximately $6.2 billion) – about five times the 2020 level (Sakenova, 2025). This increase refers to formal online trade captured in official statistics, rather

than informal digital transactions, which are much harder to measure. This rapid digital uptake illustrates how entrepreneurs in the region leveraged technology to adapt when traditional informal modes of operating (e.g. physical marketplace trading or cash sales) were temporarily closed off (Karimov et al., 2022).

This wave of digital transformation in particular has further blurred the line between informality and formality in new ways (Lakemann and Lay, 2019; Peña et al., 2024). On one hand, using formal online marketplaces, delivery apps, or mobile payment systems pull informal businesses into greater visibility and traceability, thus inadvertently creating pathways to formalisation (Acquah et al., 2025; Chacaltana et al., 2018; Shahid et al., 2025). For example, an informal home-based baker who starts accepting digital payments or registers on a food delivery app might find themselves gradually drawn into the tax and regulatory system, as their transactions become more transparent to authorities. On the other hand, digital tools also enable the continuation of informality at scale (Maiti and Khari, 2025). Entrepreneurs can leverage encrypted messaging groups, peer-to-peer sales platforms, and online payments to conduct unregistered commerce in a manner that remains difficult for regulators to monitor. The net effect of digital adoption on regulatory compliance is therefore an open question that concerns this thesis: it may simultaneously encourage some informal entrepreneurs to formalize (intentionally or inadvertently) while allowing others to amplify informal operations using new technologies. In light of the above, this thesis challenges a persistent assumption in mainstream entrepreneurship research on the "informal economy". Orthodox perspectives often treat informality as a residual (La Porta and Schleifer, 2014), low-productivity (Floridi et al., 2020) segment operating at the margins of regulation and taxation (Kanbur, 2017), and explain participation through a simple cost–benefit calculus in which firms and workers engage in informality primarily to avoid the fiscal and regulatory costs of formality (Dell'Anno, 2022; Williams, 2018). When this narrow understanding dominates, analysis may overlook the broader institutional and relational dynamics through which informal practices are sustained and reproduced (Sen et al., 2022). This can lead to interpretations that privilege enforcement-oriented responses, such as tightening enforcement (De Giorgi et al., 2018; Haarman et al., 2022) or raising penalties (Williams, 2019), while paying less attention to the ways entrepreneurs rely on informal networks to access credit, resolve disputes, or test new ideas (Peng et al., 2022; Williams & Horodnic, 2017).

To address this one-sided perspective, the thesis conceptualises informality as a dense web of embedded practices and relationships that actively structure market participation in Kazakhstan and Kyrgyzstan (Aliyev, 2015; Polese et al., 2023). By this, I refer to the fact that economic action is not organised only through formal rules and contracts, but is also embedded in durable social ties, reciprocity, reputation, kinship, and informal networks through which

entrepreneurs access information, mobilise resources, coordinate exchange, and manage uncertainty (Minbaeva et al., 2023; Werner, 2000). This understanding draws on the embeddedness tradition, which shows that economic behaviour is socially situated rather than atomised, and on scholarship on informal institutions (Granovetter, 1985, Helmke and Levitsky, 2004), which defines them as socially shared, usually unwritten rules created and enforced outside officially sanctioned channels. In post-Soviet contexts specifically, informality is therefore not simply a residual sphere outside the state, but an imbricated order of practices linking households, firms, markets, and state actors through everyday arrangements that make exchange possible when formal procedures are seen as costly, slow, or unreliable. In this sense, the 'dense web' refers both to repeated interpersonal relations and to the informal norms and enforcement mechanisms that stabilise those relations over time, thereby shaping how entrepreneurs compete, adapt, and innovate. The empirical focus thereby is on pervasive informal arrangements – rooted in social networks, cultural norms and institutional weaknesses – and on how these arrangements shape entrepreneurial initiatives, interactions between formal and informal firms, and, crucially, innovation outcomes (Ketchen et al., 2014; Siqueira et al., 2016; Webb et al., 2020; Salvi et al., 2023). Making this dense web visible is essential for understanding why entrepreneurs behave as they do and for designing policies and support instruments that are realistic and effective in such environments.

Focusing on Kazakhstan and Kyrgyzstan, the thesis adopts a mixed-methods, multi-level research design **to investigate the informality–innovation nexus under conditions of institutional uncertainty, as shown in Figure 1.**

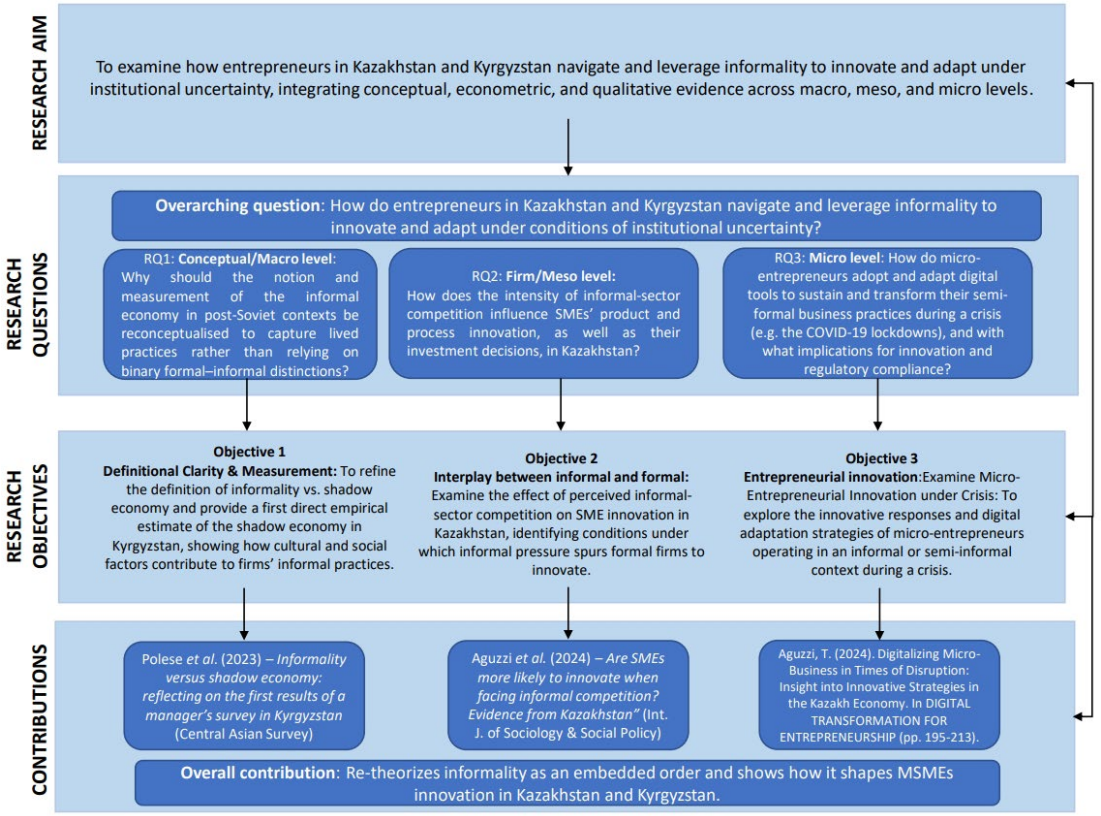

Figure 1 Overall Research Aim, Questions, Objectives and Contribution. Source: Composed by the author

The overall research aim of the thesis is therefore to examine how small and micro- businesses in Kazakhstan and Kyrgyzstan navigate and leverage informality to innovate and adapt under institutional uncertainty, integrating conceptual, econometric, and qualitative evidence across macro, meso, and micro levels. A multi-level design is adopted because informality is a system phenomenon that operates simultaneously at the macro level (institutional arrangements), meso level (market structure and competitive pressures), and micro level (entrepreneurial practices). Looking at only one level can lead to wrong inferences, either by assuming that patterns in the whole system apply to each firm or entrepreneur (ecological error) or by generalizing from individual cases to the entire system (atomistic error). A multi-level view avoids these mistakes by linking macro institutions, market dynamics, and micro practices. In addition, examining a single level obscures the cross-level mechanisms by which informality shapes innovation choices. Methodologically, integrating qualitative and quantitative evidence across levels enables theory building, linking conceptual re-theorization to firm-level regularities and micro-process accounts,

which is in line with best practice in multilevel organizational research (Klein & Kozlowski, 2000) and mixed-methods inquiry (Creswell & Plano Clark, 2023).

Taken together, this thesis treats informality as systemic and consequential for innovation dynamics, rather than as a marginal or temporary deviation. By integrating macro-conceptual, firm-level, and micro-level perspectives, the thesis is guided by one overarching research question (RQ): How do entrepreneurs in Kazakhstan and Kyrgyzstan navigate and leverage informality to innovate and adapt amid institutional uncertainty? To unpack this RQ, the doctoral thesis is structured across the following three integrated levels and associated questions:

1. Conceptual/Macro – *Why should the notion and measurement of the informal economy in post-Soviet Kyrgyzstan be reconceptualised to capture lived practices rather than relying on binary formal–informal distinctions?* In other words, how might we reconceptualise "informality" in these settings so that it reflects everyday economic behaviours and institutional realities more accurately than conventional shadow economy metrics?

2. Meso/Firm – *How does the intensity of informal-sector competition influence SMEs' product and process innovation, as well as their investment decisions, in Kazakhstan?* Here the focus is on firm-level behaviour: do companies facing more prevalent informal competition innovate less (due to constrained resources and unfair competition), or perhaps more (as a means to differentiate and survive)?

3. Micro/Entrepreneur – *How do micro-entrepreneurs adopt and adapt digital tools to sustain and transform their semi-formal business practices during a crisis (e.g. the COVID-19 lockdowns), and with what implications for innovation and regulatory compliance?* This level delves into individual entrepreneurial strategies during disruption: examining how small-scale traders or service providers used digital platforms to cope, and whether this led to innovative practices or shifts toward formalization.

The thesis highlights the nuanced role that informality plays in shaping economic development – demonstrating that IE, far from being merely a shadow or hindrance, is an organic component of the market landscape that can both constrain and catalyse innovation under the right conditions. *Theoretically*, it reframes informality from a residual "sector" to a relational, practice-based institutional order by distinguishing shadow-economy measurement from informality as lived practice, addressing long-standing gaps in Kyrgyzstan/Central Asia where standard Multiple Indicators, Multiple Causes (MIMIC) estimates say little about everyday market participation (Schneider, 2015; Feld and Schneider, 2010; Williams and Schneider, 2016). *Empirically*, the results challenge the

dominant “informality-as-drag” view by demonstrating a stimulating effect of informal competition on SME innovation and by documenting how micro-entrepreneurs reconfigured sales, payments, and supply chains through platforms and localisation to survive disruption, with nuanced implications for (de)formalisation. *Practically*, the thesis cautions against blanket repression of informality and deterrence approaches, instead motivates policymakers and relevant stakeholders in the field of entrepreneurship to implement targeted instruments—reducing compliance frictions that compress margins for compliant SMEs, coupling digitalisation programs with gradual formalisation pathways, and designing innovation and tax/financial literacy support that works with (rather than against) the embedded norms and networks through which firms actually transact in Kazakhstan and Kyrgyzstan.

The thesis is organized into five chapters. This chapter (Chapter 0) introduced the research problem, objectives, and the significance of examining the informality–innovation nexus in the Central Asian context. Chapter 1 develops the conceptual foundations of the thesis by defining informality, distinguishing it from the “shadow economy”, and reviewing the theoretical and empirical literature on competition from informal firms and its effects on SME innovation. Chapter 3 sets out the methodology, articulating the ontological and epistemological stance and detailing the mixed-methods, multi-level research design and procedures. Chapter 4 presents the results from the three articles, highlighting their distinct contributions to understanding innovation under pervasive informality. Chapter 5 synthesizes the theoretical, methodological, and practical contributions, as well as a concluding section, which reflects on limitations, outlines avenues for future research, and summarise the main insights.

Abbreviations

IE	Informal Entrepreneurship
ILO	International Labour Organization
WB	World Bank
MIMIC	Multiple Indicators, Multiple Causes
SME	Small and Medium Enterprise
GDP	Gross Domestic Product
DT	Digital Transformation
KZT	Kazakh Tenge

Explanations of abbreviations used in the thesis.

1 Conceptual Distinctions and Theoretical Foundations in Informal Entrepreneurship and Innovation

1.1 Conceptual Clarifications and Distinctions of Informality

A key implication of this definition is that informality cannot be specified without reference to the state. What counts as 'formal' is constituted through the reach, design, and enforcement of state regulation, while what remains informal depends not only on whether rules exist on paper, but also on whether they are perceived as legitimate, proportionate, and practically usable by economic actors. For this reason, the thesis treats state capacity, regulatory coherence, and the social legitimacy of rules as constitutive dimensions of informality rather than as external background conditions (Bruton et al., 2010; Bendig et al., 2024; Li et al., 2024). The concepts of informal economy, informal entrepreneurship, shadow economy and informality are interrelated but distinct in the academic literature. It is essential to clarify their meanings and boundaries, as well as related terms like formal entrepreneurship, informal competition, and innovation in SMEs, to avoid conceptual confusion. Separating these concepts is central to the thesis' contribution. The conceptual contribution lies in theorising informality as a broader institutional and relational order that exceeds what can be captured through aggregate hidden output, whereas the measurement contribution lies in showing how direct survey-based estimation of the shadow economy can be used to reveal the limits of binary formal–informal categories. The two contributions are related, but they are not identical: one concerns what the phenomenon is, the other concerns how one measurable expression of it can be estimated and interpreted.

The informal economy is defined by the ILO as the set of market-oriented activities carried out by workers and economic units that are, in law or in practice, only partially or not at all covered by formal regulatory, fiscal and social protection frameworks (ILO, 2018). The informal economy includes two main elements: informal employment in formal enterprises, referring to workers whose employment relationships are not fully declared, regulated, or protected even though the firm itself is formally registered; and the informal sector, referring to unregistered or weakly regulated enterprises and income-generating activities that produce legal goods and services outside the full scope of state oversight (Cozzens and Sutz, 2014). These activities often lack formal protections such as contracts or social insurance and include a wide range of jobs (e.g. street vending, home-based work, unregistered micro-businesses) with no work-based social protection and have significant implications for public finances, since high rates of informal employment reduce income and employment-related tax

revenues and, in turn, government's capacity to fund social protection and policies tackling the informal economy.

The shadow economy, by contrast, refers to the measurable, underreported part of otherwise legal economic activity that is concealed from public authorities for tax, labour, or regulatory reasons (Putniņš and Sauka, 2020), rather than to the broader set of social practices and relationships associated with informality. In other words, the shadow economy encompasses under-reported business revenues, off-the-book employment, and other hidden transactions contributing to a nation's GDP, whereas the informal economy is a broader umbrella covering not only those hidden monetary activities but also the social and cultural practices that enable them. In Polese et al. (2023), it is highlighted that while the two terms are related and historically were even used interchangeably, contemporary studies highlight the importance of distinguishing them as separate (if connected) constructs. Specifically, informality can be seen as the environment or set of practices and norms (the "symbolic, material and socio-cultural" milieu) that may lead individuals and firms to engage in off-the-record exchanges, whereas the shadow economy is the outcome in economic terms – the aggregation of those unreported exchanges by actors "in the shadows". The first article composing this thesis does not merely estimate the size of the shadow economy as a share of GDP through a manager survey; more importantly, it uses this measurement exercise to interrogate the limits of binary formal–informal distinctions and to show how underreporting is embedded in broader attitudes toward taxation, public services, and bribery. In this way, the article moves beyond quantification alone and contributes to a wider reconceptualisation of informality as a socially and institutionally embedded set of practices rather than a purely hidden economic residue.

A challenge in the literature dealing with the informal economy is that overly broad definitions of informality can blur important distinctions. For instance, a too-inclusive notion of the informal economy might overlap with outright illegal or criminal activities, generating confusion between what is informal (unregulated but not necessarily criminal) and what is illegal (explicitly against the law). Scholars such as McElwee and Smith (2015) have noted the risk of conflating informal entrepreneurship with illicit enterprise if concepts are not clearly delineated. In this thesis, informal entrepreneurship is defined as entrepreneurial activity that operates partially or wholly outside formal registration and regulation. The thesis specifies that this includes businesses which, at their inception, do not register their enterprise or do not report some or all of their economic activity (production, sales, earnings) to tax authorities. Such informal entrepreneurs often take advantage of more flexible, low-cost operations (for example, avoiding licensing fees, taxes, or labour regulations) but simultaneously forego the legal protections and support systems available to

formal firms. In contrast, formal entrepreneurship refers to venture creation and business operations that are fully registered with authorities and comply with all applicable laws and regulations from the outset. Formal entrepreneurs file taxes, adhere to labour laws (e.g. formal employment contracts), and generally operate "on the books." The boundary between informal and formal business, however, is not always clear-cut; it is often blurred and fluid, with some enterprises transitioning from informal to formal status over time or operating in a gray zone. Factors such as the stringency of regulations, enforcement capacity, and cultural norms influence where this line is drawn. For example, many informal entrepreneurs may initially evade taxes or registration but later formalize once their business grows, a pattern that has been documented in emerging economies (Williams et al., 2017). Notably, Williams et al. (2017) found that enterprises starting unregistered can in some cases outperform those that were formal from inception, challenging the orthodox view that informal start-ups are inevitably underproductive (Williams and Kedir, 2018). This points to a definitional and policy tension: earlier approaches (e.g. Oviedo et al., 2009) tended to treat informality as a deviation from formal regulatory arrangements to be reduced, whereas more recent research suggests a more nuanced continuum between informality and formality, with informal entrepreneurship sometimes serving as a stepping stone to formal business growth.

In emerging contexts like Central Asia, a significant interplay exists between the informal sector and formal SMEs. Informal competition denotes the competitive pressure that formally registered firms experience from informal sector businesses. These informal rivals typically enjoy lower operating costs by bypassing taxes, labour laws, and other regulations, allowing them to offer lower prices or otherwise gain market advantage. From the perspective of formal SMEs, such unregulated competition can pose a serious challenge – effectively an "unfair" playing field where informal firms' cost savings (through tax evasion or non-compliance) enable them to undercut prices. This dynamic has fuelled a debate in the literature about how informal competition affects innovation in SMEs. One view is that informal competition dampens innovation in formal enterprises, since the latter may struggle to invest in new products or processes while being undercut by competitors who avoid the costs of innovation and regulation. Indeed, studies have found that when informal firms flood the market with cheaper, unregulated goods, formal firms might reduce their innovation efforts due to resource diversion and perceptions of an uneven playing field. On the other hand, a contrasting body of work highlights an 'escape-competition effect', whereby increased competition—even from informal rivals—can spur formal SMEs to innovate in order to move away from direct price-based rivalry. Rather than competing only on cost, firms may respond by differentiating their products, improving processes, upgrading quality, or introducing more novel offerings that are harder for informal competitors to imitate. In this sense, innovation becomes a strategy for escaping head-to-head competition and

defending market position, although the effect is likely to be strongest under moderate competitive pressure and to weaken when rivalry becomes overwhelming (Aghion et al., 2005; Wang and Wang, 2024). In this view, the presence of informal competitors can act as a stimulus for product or process innovation, especially in sectors where technological gaps are small, and firms can relatively quickly upgrade or diversify. Recent evidence from emerging markets supports this nuanced perspective: for example, formal companies might respond to informal competition by improving quality, adopting new technologies, or finding niche markets that informal firms cannot easily serve.

As shown in Table 1, informal entrepreneurship, semi-formality, informality, and the shadow economy are closely linked phenomena, but they represent different analytical angles. Informality refers to the broader social and institutional milieu of norms, relations, and practices; semi-formality captures the hybrid organisational condition in which formal presence coexists with informal practices; and the shadow economy refers to one measurable monetary expression of those practices. Distinguishing these levels is crucial for the thesis because it clarifies how informal arrangements shape entrepreneurial behaviour and innovation without reducing the phenomenon to aggregate hidden output alone. Formal entrepreneurship stands in contrast, grounded in regulatory compliance, yet it does not exist in isolation: formal ventures often contend with informal competition in the same markets, and those competitive dynamics in turn shape strategic responses and innovation choices.

Concept	***Definition and Key Boundaries***
Informal Economy	*The broad set of economic activities, jobs, and transactions that occur outside formal government regulation or taxation. It includes unregistered businesses and informal employment lacking legal protections. The informal economy often accounts for a large workforce share in emerging markets (e.g. ~2 billion workers globally in 2018).*
Shadow Economy	*The subset of the informal economy consisting of legal goods and services production deliberately concealed from authorities to avoid taxes or regulations. Essentially, it is the hidden economic output (under-reported revenue, undeclared wages, etc.) as a percentage of GDP. Polese et al. describe the shadow economy as the monetary expression of informality – the "shadow" cast by informal practices into national accounts.*
Informality	*The aggregate of symbolic, material and socio-cultural practices that can push some segments of a population to engage in shadow economic transactions (and accordingly to remain, partially or completely, in the shadows).*
Informal Entrepreneurship	*Entrepreneurial activity that operates without full formal registration or compliance. Informal entrepreneurs start and run businesses off the books, for example by not registering the firm initially or by not reporting part of their income/employees to the state. These ventures exploit opportunities in spite of (or due to) regulatory burdens, often using informal arrangements (e.g. cash payments, family labour). They commonly bypass taxes and labour laws, which lowers costs but also limits access to formal financing and legal recourse.*
Formal Entrepreneurship	*Entrepreneurial activity that is officially registered and fully complies with government regulations from inception. Formal entrepreneurs obtain necessary licenses, pay taxes, and adhere to labour and business laws. In contrast to their informal counterparts, formal businesses operate within the "rules of the game" set by authorities, gaining legal protections and access to formal support (bank credit, courts) but incurring higher regulatory costs.*

Informal Competition	*Competitive pressure on formal firms arising from informal sector players. Informal competition typically comes from unregistered or tax-evading businesses selling similar products or services. Because such informal competitors avoid many costs (taxes, social contributions, compliance expenses), they can offer lower prices or circumvent standards, thereby challenging formal SMEs. The intensity of informal competition can vary, and firms perceive it as an important factor shaping their strategic decisions (including whether to invest in innovation).*
Innovation in SMEs	*The process by which micro, small and medium-sized enterprises develop and implement new or significantly improved products, services, or processes. Innovation can be product innovation (introducing new goods/services or significantly enhancing existing ones) or process innovation (improving internal operations or workflows for better efficiency). For SMEs, innovation is a critical strategy for growth and competitiveness, though it is often constrained by limited resources. In contexts with high informality, SME innovation may lean towards incremental adaptations or frugal innovations tailored to local market conditions, given resource and institutional constraints.*
Semi-formality	*A hybrid condition in which businesses maintain some elements of formal registration or compliance while simultaneously relying on informal practices such as partial reporting, off-the-books labour, or unrecorded transactions. Semi-formality is important in this thesis because it captures the modal condition observed across the empirical material more accurately than a strict formal/informal binary.*

Table 1: Key conceptualisations and boundaries in IE.

IE and the shadow economy are closely linked phenomena, but they represent different angles – one at the level of entrepreneurial actors and the other at the level of aggregate economic effects. Shadow economic activities are generated and reproduced through the everyday practices of the very actors that policy seeks to regulate. In the Central Asian context, it is therefore important to distinguish between informality, understood as a broader set of socio-cultural practices and relational norms, and the shadow economy, understood as the measurable monetary outcome of those practices. This distinction helps clarify that informality provides the context within which entrepreneurs operate, while the shadow economy captures one observable economic expression of the choices made within that context. This distinction is crucial to understand how informality and the informal sector competition deriving from it shape

entrepreneurial behaviour when it comes to innovation. Informal entrepreneurs are manifestations of the informal economy that alter the opportunity set, constraints and strategic responses of formal firms. Building on this premise, the thesis examines how such pervasive informal arrangements and competitive pressures influence innovation decisions and digital adaptation among SMEs in Central Asia. The informal economy provides the milieu in which informal entrepreneurs operate, and their activities contribute to the measured shadow economy. Formal entrepreneurship stands in contrast, grounded in regulatory compliance, yet it does not exist in isolation: formal ventures often must contend with informal competition in many developing economies. These competitive dynamics, in turn, have implications for innovation.

The next section builds on these conceptual clarifications by discussing the theoretical frameworks, namely institutional theory, an attention-based view of the firm, and digital transformation, that explain why and how informality and innovation interact as they do.

1.2 Theoretical Foundations and Analytical Framework of informality, informal competition and innovation in SMEs.

Understanding informality in entrepreneurship and its relationship with innovation requires drawing on three key conceptual lenses used in the literature to explain informality and entrepreneurial behaviour under constraints: (1) Institutional theory, (2) the Attention-Based View (ABV) of the firm, and (3) the digital transformation literature (DT). The two theoretical perspectives, together with the DT framework, operate at complementary analytical levels and are aligned with the three core research questions. Institutional theory (Section 1.2.1) is primarily relevant at the macro level, as it explains why informality emerges and persists, and how institutional voids, weak enforcement and mismatches between formal rules and local norms can dampen, reshape or redirect innovation dynamics. The Attention-Based View (ABV) (Section 2.2) operates at the firm and managerial level and is particularly suited to analysing how pressures arising from informal competition shape SME managers' allocation of attention and, consequently, their strategic choices regarding product and process innovation; it thus underpins the examination of informal competition's impact on innovation in RQ2. Finally, rather than a formal theory, the digital transformation literature (Section 2.3) is mobilised as an analytical lens at the micro and process level to account for how micro-entrepreneurs in Kazakhstan respond to shocks such as the COVID-19 pandemic by adopting and adapting digital tools, thereby informing the analysis of crisis-induced digital adaptation and its implications for semi-formal business practices in RQ3. Each framework addresses a different facet of the informality–innovation nexus:

institutional theory explains macro-level context, ABV captures firm-level behaviour, and the digital transformation lens illustrates how technology mediates the challenges and opportunities of operating in and around informality.

1.2.1 Institutional Theory: Formal Institutions, Informality, and Innovation

Institutional theory in the context of entrepreneurship focuses on how the rules, norms, and expectations in a society shape economic behaviour (Bruton et al., 2010; Welter and Smallbone, 2011). Douglass North's oft-cited definition of institutions as "the rules of the game" highlights that entrepreneurs do not act in a vacuum – they respond to formal institutions (laws, regulations, enforcement mechanisms) and informal institutions (cultural norms, values, social networks) in their environment (North, 1990). The prevalence of informal entrepreneurship is frequently a reflection of institutional context. In many developing economies, excessive regulatory burdens, weak rule of law, and limited state capacity create conditions where operating formally is costly or cumbersome. Under such conditions, many entrepreneurs opt for informality as a rational strategy – a theme famously articulated by Hernando de Soto (1989) who argued that cumbersome bureaucracy and "extralegal" barriers push the poor into the informal sector as an alternative path to pursue business opportunities (Williams et al., 2015). More recent studies reinforce this view: a high tax burden, onerous licensing requirements, or corrupt enforcement of rules are all institutional factors correlated with larger shadow economies (Wu and Schneider, 2019). In Kyrgyzstan, for example, the shadow economy's size has been linked to the quality of institutions – with researchers finding that heavy taxes and unpredictable regulation encourage businesses to under-report or stay unregistered (Izvorski et al., 2020). National strategy documents similarly point to contradictory and frequently changing legislation, weak legal culture and the scope for arbitrary enforcement as factors that motivate citizens to disregard formal rules when these clash with everyday economic reality (Abykeeva-Sultanalieva et al., 2022)

Importantly for this thesis, institutional theory also emphasizes the role of informal institutions – the unwritten rules and societal attitudes. There can be a substantial divergence between official rules and local norms. Williams (2015) and others have posited that if formal institutions (like tax laws) lack legitimacy in the eyes of the populace, informal entrepreneurship will be socially tolerated or even tacitly encouraged. Polese et al. (2023) provide an example of this in Central Asia: they note that many businesspeople view informal practices as a form of quiet resistance or practical adaptation to a malfunctioning state system. In Kyrgyzstan, a legacy of Soviet collapse and slow institutional reforms means that trust in state support and formal institutions is low. Informal entrepreneurs

frequently perceive the state's rules as misaligned with the economic reality on the ground (or even "unfair"), leading to a moral justification for circumventing those rules (Fehlings and Karrar, 2020). Williams and Horodnic (2017) describe this as a gap between individual morality and state-imposed morality, finding that higher institutional asymmetry is associated with greater participation in informal entrepreneurship (Williams, 2018). As a result, many firms operate less formally not purely to save money, but because informality is culturally normalized as how one copes with an ineffective or unfair system. These firms might simply adopt alternative strategies to get business done, born out of a different understanding of business rules and a lack of effective regulatory frameworks. In other words, informal entrepreneurs are still pursuing opportunity and growth, but through informal channels that make sense given the institutional voids or inconsistencies.

This institutional theory has direct implications for innovation. When formal institutions are weak, inconsistent, or difficult to rely on, firms may be less willing to invest in formal innovation activities such as R&D or patenting, because the expected returns to those investments become more uncertain—for example, where intellectual property rights are not effectively protected, or rules are unevenly enforced. Studies of transition and emerging economies show that institutional voids often push entrepreneurs to rely on informal networks and non-contractual arrangements, with implications for their ability and willingness to engage in long-term, risky innovation projects (Puffer et al., 2010; OECD, 2017). Instead, innovation may take more informal forms: improvisational and frugal innovation that leverages readily available resources and local knowledge, rather than formal technology development (Khattak et al., 2022). For example, an informal workshop in a bazaar might "innovate" by repurposing second-hand machinery to create a new product – a creative solution born from necessity, but not recorded in any official innovation statistics. Research on informal enterprises often notes their tendency toward incremental improvements and imitation of existing products, rather than breakthrough innovations (Avenyo, 2021). This is partly due to resource constraints (limited access to capital, skilled labour, etc.) and partly due to the short-term planning horizon enforced by an uncertain institutional environment. If a business fears sudden inspections or policy changes, it may prefer quick, low-profile returns over risky long-term innovation projects.

Institutional theory also suggests that when the misalignment between formal rules and informal norms is addressed, entrepreneurial innovation can flourish (Plata et al., 2021, Wang and Zhou, 2020). Government strategies such as smart specialization (Lehmann et al., 2025) or GUFE ("Guichet Unique de Formalisation des Entreprise") aim to formalize the informal sector not just through punitive measures but by reforming institutions – simplifying business registration, offering micro-entrepreneurs legal incentives to formalize, and building trust

(Benhassine et al., 2015). Such approaches, advocated by bodies like the ILO and World Bank, seek to bring informal entrepreneurs into the formal economy by reducing the institutional barriers that kept them out. The underlying assumption is that once informal businesses enter the formal realm, they will gain better access to finance, protection, and support for innovation (e.g. eligibility for grants or training programs), thereby improving their growth prospects. Indeed, Williams et al. (2017) found evidence that some entrepreneurs who started informally and later formalized achieved higher performance, suggesting that bridging the formal-informal divide can unlock productive potential. Moreover, institutional improvements – such as stricter enforcement against corruption or more consistent application of regulations – can change the cost-benefit calculus of innovation. In Kazakhstan's recent history, for instance, policy moves to support SMEs and digital infrastructure (e.g. e-government services, start-up support programs) have expanded the range of formally accessible tools available even to micro-entrepreneurs, creating additional channels through which business activities can be organised alongside, or in interaction with, existing informal practices (Williams, 2023).

For the purposes of this thesis, the mechanism linking informality as an institutional order to innovation can be stated more explicitly. Macro-level institutional conditions shape the predictability, legitimacy, and usability of formal rules; these conditions in turn structure meso-level market dynamics such as the intensity of informal competition and the relative costs of compliance; and these market conditions are then translated into micro-level entrepreneurial practices, including selective compliance, resource recombination, and digitally mediated adaptation. In this way, informality affects innovation not only by constraining formal investment channels, but also by altering the opportunity structure, attention priorities, and coordination mechanisms through which entrepreneurs pursue change.

In summary, institutional theory provides a macro-level understanding of how informality and innovation are shaped by the 'rules of the game' in a given country. Where formal institutions impose high costs, are unevenly enforced, or lack legitimacy, entrepreneurs often rely more heavily on informal arrangements, and this in turn shapes the forms of innovation that appear feasible, worthwhile, or strategically sensible. The point is not that stronger formality automatically produces innovation, but that the relationship between innovation and informality depends on how entrepreneurs experience and navigate the institutional environment in practice.

1.2.2 Attention-Based View (ABV)

The Attention-Based View (ABV), rooted in organizational theory, argues that what decision-makers attend to shapes strategic choices and, ultimately, firm behaviour (Joseph et al., 2024). Because managerial attention is a scarce cognitive resource, firms cannot respond equally to all issues at once; rather, outcomes depend on how attention is prioritised and channelled across competing demands (Brielmaier and Friesl, 2023; Ocasio, 1997). In the context of informal entrepreneurship and innovation, ABV offers a useful lens for examining how pressures associated with informality influence entrepreneurial focus and strategic response. This thesis applies ABV specifically to the case of Kazakh SMEs facing informal competition, because this is the part of the research that operates at the firm and managerial level, where attention allocation under competitive pressure can be meaningfully examined. By contrast, the Kyrgyzstan study serves a different analytical purpose—namely the conceptual and macro-level reconceptualisation of informality and shadow-economy measurement—and does not provide comparable evidence on managerial attention or innovation behaviour. The selective use of ABV is therefore best understood as a theory–method fit decision. When entrepreneurs perceive strong informal competition, they may be forced to divide their limited attention between immediate operational concerns—such as coping with revenue losses or price undercutting—and longer-term strategic investments in innovation aimed at differentiation and survival. ABV suggests that such competing demands can weaken sustained commitment to innovation, particularly in small firms, where owners and managers often have limited possibilities for delegation and must simultaneously manage both routine operations and strategic development (Massa and Testa, 2008).

Under an ABV framework, two possible attention-allocation responses to informality emerge. On one hand, entrepreneurs might adopt a divided attention strategy: spreading their focus thinly across managing immediate operational challenges posed by informal competitors and seeking innovation opportunities simultaneously (McCann and Bahl, 2017; Kahneman, 1973). In this mode, the presence of informality keeps the manager's attention oscillating between "fighting fires" (e.g. responding to an informal competitor undercutting prices) and longer-term innovation efforts. The downside is that divided attention can undermine the effectiveness of innovation pursuits, as the manager's capacity is constantly strained. On the other hand, entrepreneurs may pursue a focused attention strategy, concentrating predominantly on the threat of informal competition. In this scenario, managers treat informal competition as a central issue and may even view innovation as a means to address that issue – for example, focusing their innovation efforts specifically on differentiating their products or cutting costs to compete with informal firms. In effect, the pressure from informality can "capture" managerial attention and reorient innovation strategy to be a tool for survival in an informality-rich environment (Amin, 2025).

ABV also sheds light on how the intensity of informal pressure matters. A moderate level of competition from informal actors might serve as a stimulus that keeps managers alert and encourages creative problem-solving. Indeed, manageable challenges are often considered psychologically stimulating for decision-makers, prompting capability development and proactive strategies. Empirical illustrations in the literature show that when faced with some degree of informal competition, formal businesses have responded by engaging employees in problem-solving and seeking diversification or quality improvements to stay ahead (Heredia et al., 2017; Hlioui et al., 2022). In contrast, very high levels of informality—where entrepreneurs operate in markets heavily structured by widespread informal competition and enduring cost asymmetries—may redirect managerial attention away from longer-term innovation and toward more immediate operational responses (Cai et al., 2022; Dou et al., 2022). This does not imply that informality is inherently disabling; rather, it suggests that when such pressures become especially intense, the demands of day-to-day adjustment may crowd out the attention required for sustained innovation. In such cases, owners may conclude that investing in innovation is futile (an "impossible barrier to overcome") and instead focus solely on short-term survival or cost-cutting. Thus, ABV suggests a nonlinear relationship: informality that is salient but not overpowering may focus attention in productive ways, whereas informality perceived as overwhelming can absorb all attention and crowd out forward-looking innovation. This theoretical view helps explain the mixed evidence on informal competition's impact on innovation – it depends in part on how entrepreneurs allocate attention under different levels of stress from the informal environment. Some studies report positive or conditional effects on product innovation and quality upgrading, while others find net negative effects when informal competition is pervasive or institutional conditions are weak (Miocevic et al., 2022; Wang and Wang, 2024).

1.2.3 Digital Transformation as a Conceptual Lens

Digital transformation (DT) literature explains how organizations use digital technologies to reconfigure operations, business models and customer engagement. Foundational contributions (e.g., Westerman et al., 2014; Vial, 2019) conceptualize DT as a strategic realignment rather than mere technology adoption: successful transformation depends on organizational capabilities, culture, and complementary process change. In this sense, technologies such as mobile applications, online marketplaces, social media, and cloud computing are not only tools but catalysts for innovation and new value creation for small firms in emerging economies (Soomro et al., 2024).

While originally developed for large formal firms (Westerman et al., 2014), DT has gained relevance for micro- and informal enterprises, particularly in

environments of constraint as well. During the COVID-19 crisis, many small firms fast-tracked the adoption of digital tools, especially online sales channels, platform-based marketing, remote customer interaction, and digital payments, achieving in a few months changes that would otherwise have taken years to be reached (Amankwah-Amoah et al., 2021; OECD, 2021). Empirical studies document how SMEs and micro-firms adopted e-commerce, digital marketing, and mobile-money systems in response to disruption, using these tools to adapt their operations and reconfigure how they reached and served customers (Papadopoulos et al., 2020; Priyono et al., 2020; Klein & Todesco, 2021). In Asia and other emerging regions, informal traders used social-media and messaging platforms as low-cost sales and coordination channels (Shinozaki & Ueda, 2022). Similar patterns were observed across Central Asia, where lockdowns exposed the vulnerability of bazaar-based and service micro-enterprises. In Kazakhstan, government emergency measures—including a temporary moratorium on taxes and inspections for micro-businesses—were introduced during the same period in which online transactions and mobile-payment usage expanded rapidly (Makasheva and Tussupova, 2021; OECD/EU, 2023). Comparable reports from Kyrgyzstan highlight accelerated adoption of online marketplaces and delivery apps among micro-entrepreneurs previously operating entirely offline (Fehlings, 2025). These contextual developments provide the background for this thesis's focus on how digital transformation reshapes informal entrepreneurship under crisis, without yet anticipating empirical findings.

Building on the DT literature – in particular Westerman et al.'s (2014) conceptualisation of DT as a strategic realignment of processes and business models, and Vial's (2019) synthesis of how digital technologies enable value creation – this thesis distinguishes three DT-related insights that are especially relevant for understanding informal and semi-formal small businesses in Kazakhstan. These insights are not a separate concept but a problem-focused reading of this literature that helps explain how digital tools mediate the relationship between informality and innovation in my empirical setting.

First, digital tools can mitigate some structural disadvantages of informality. Lacking fixed premises, formal credit access or supply-chain infrastructure, informal entrepreneurs can use social-media shops, online marketplaces, or peer-to-peer delivery networks to reach customers and coordinate suppliers at low cost. Platform participation effectively supplies "quasi-formal" infrastructure—payment systems, reputation mechanisms, and traceable records—that partially substitutes for formal institutions. Evidence from emerging economies shows that such tools can enhance market access and stimulate incremental innovation among informal micro-enterprises (Atiyas & Dutz, 2021; Johri et al., 2024; Hunter, 2024).

Second, engagement with formal digital infrastructures—online marketplaces, delivery apps, mobile-money and banking interfaces—often

requires some degree of registration and generates digital traces of transactions. This visibility can draw informal firms into closer contact with formal institutions, creating pathways toward partial formalisation (Johri et al., 2024; Hunter, 2024; Onyima & Okeleke, 2017; Faik, 2026). For instance, sellers using payment gateways or delivery-platform accounts must provide tax identifiers or business credentials, while repeated use of mobile-money wallets can generate transaction histories that facilitate access to formal credit. In this sense, digital infrastructures can act as soft mechanisms of institutional inclusion.

At the same time, digital technologies also create new avenues to remain or even deepen informality. Studies of platform economies (e.g., Horodnic et al., 2023) show that consumers and providers increasingly rely on digital intermediaries to conduct unregistered transactions, sustaining undeclared work online. Fintech ecosystems in emerging markets frequently maintain cash-on-delivery and unregulated peer-to-peer payment options, allowing micro-entrepreneurs to exploit digital visibility for marketing while keeping financial flows opaque (Park, 2024). UNDP surveys of informal businesses across sixteen countries confirm that many small traders use WhatsApp, Facebook Marketplace or Telegram channels to sell without registration, effectively decoupling digitalisation from formalisation (Gustale & Cottica, 2023; UNDP Accelerator Labs, 2023). Fransen et al. (2024) describe how such "hybrid informality" in Nairobi's Mathare settlement enables digital resilience without regulatory integration, while evidence from Uzbekistan shows that P2P payment apps and cash-on-delivery practices can sustain off-the-books transactions even as overall digital payment volumes rise (UNDP, ILO & CERR, 2025). Likewise, research on Uruguay's financial-inclusion reform finds that widespread electronic-payment adoption did not automatically improve tax compliance, underlining that the fiscal impact of digitalisation is highly context-dependent (Brockmeyer & Sáenz Somarriba, 2025).

These findings related to the first two insights underscore that DT does not produce a linear trajectory from informality to formality but rather hybrid constellations in which firms operate simultaneously across both spheres. In post-Soviet economies such as Kazakhstan and Kyrgyzstan, this hybridity is particularly salient. Entrepreneurs often blend formal registration with informal employment or accounting, and digital tools may amplify rather than resolve such duality.

Third, DT literature highlights the importance of organisational and cognitive change. Even micro-entrepreneurs must develop new capabilities—basic digital literacy, online customer management, and data-based decision-making—to use technology effectively. Studies of SMEs during and after COVID-19 show that firms with greater learning orientation and openness to experimentation benefited more from digitalisation (Klein & Todesco, 2021; Sagala et al., 2025).

For informal actors, the same holds: technology adoption is not purely technical but involves shifts in mindset, routines and social networks. Digital tools become part of entrepreneurs' adaptive strategies under uncertainty, enabling innovation in product delivery, marketing, and coordination despite institutional voids.

In summary, DT literature provides a meso-level framework for analysing how informal entrepreneurs navigate institutional constraints through technology-mediated adaptation. It captures the dual potential of digitalisation: to integrate informal firms into more formal structures by generating traceability and institutional contact, and simultaneously to enable new forms of informality through flexible, decentralised transactions. Understanding this tension is crucial for interpreting the evolving landscape of micro-entrepreneurship in Kazakhstan and Kyrgyzstan, where digital technologies now mediate the everyday interface between state regulation, market opportunity and informal practice.

Each of the lenses and conceptualisations presented before contributes to the central aim of this thesis: to explain how pervasive informality in Central Asia shapes SME innovation and digital adaptation. Institutional theory anchors the analysis of RQ1, by situating informal entrepreneurship and informal sector competition within the broader institutional configurations of Kazakhstan and Kyrgyzstan – explaining why informality is so pervasive and how this macro context conditions firms' scope for innovation. The Attention-Based View then underpins RQ2, by illuminating how managers of Kazakh SMEs exposed to informal competition allocate attention between coping with unfair rivals and pursuing product or process innovation, thereby accounting for the heterogeneous innovative responses observed in Article 2. Finally, the digital transformation literature informs RQ3 and Article 3 by showing how, under shock conditions such as the COVID-19 pandemic, digital tools can provide a partial "equaliser" for semi-formal and informal micro-businesses in Kazakhstan, enabling them to reconfigure customer access, marketing and operations despite institutional and resource constraints. Taken together, these perspectives do not offer a general account of "innovation in informal contexts", but a targeted explanation of how informality and innovation co-evolve in the specific settings studied in this thesis, and why some Central Asian entrepreneurs manage to convert institutional and competitive constraints into opportunities for incremental, digitally mediated innovation.

1.3 Contextualization

Kazakhstan and Kyrgyzstan share a post-Soviet institutional legacy and relatively high levels of informality, but they differ markedly in the structure of their

political economies. Both may be described as 'resource economies,' although the relevant resource is not the same. In Kazakhstan, accumulation has been anchored primarily in hydrocarbons and mineral extraction, and economic growth remains closely tied to oil production, export performance, and the fiscal capacities sustained by extractive rents (World Bank, 2023; World Bank, 2025). Yet this growth trajectory needs to be situated within the neoliberal restructuring of the 1990s, when privatisation, market liberalisation, and the transfer of public assets into concentrated private hands generated sharp inequalities in wealth, access, and economic power, while large parts of the population experienced dispossession and declining social protection (Nazpary, 2001; Sanghera and Satybaldieva, 2021). Kyrgyzstan, by contrast, is less capital-intensive and far more labour-exporting: remittances have recently accounted for around one quarter of GDP, making household welfare, consumption, and small-business activity highly sensitive to external labour markets and regional shocks (World Bank, 2025b; Abazov, 1999; Batsaikhan, 2017). For the purposes of this thesis, both countries are therefore 'resource economies,' but with distinct capital–labour configurations: Kazakhstan depends more heavily on extractive rents and the state capacities they help sustain, whereas Kyrgyzstan depends more on labour mobility, remittance inflows, and the distributive effects of externally earned income. At the same time, in both settings, post-Soviet transformations produced a persistent tension between the symbolic value of formality and the practical durability of informal coordination. Formal registration, documentary compliance, and visible adherence to official procedures remain important markers of legitimacy, yet everyday economic life continues to be organised to a significant extent through personal ties, reciprocity, and unwritten arrangements that help actors navigate uncertainty, selective enforcement, and uneven access to state institutions (Morris, 2019; Polese, 2021).

This difference in economic structure is accompanied by an important governance contrast. Comparative scholarship has long characterised Kazakhstan as marked by more centralised state capacity and a more coherent vertical of authority, whereas Kyrgyzstan has more often been associated with fragmented authority, greater regional contestation, and a less consolidated administrative hierarchy (Cummings and Nørgaard, 2004). In this thesis, that difference is treated primarily as contextual background rather than as a standalone explanatory variable: the research design is not built to test governance quality causally across the two cases, but to show how different state configurations shape the environments in which entrepreneurs navigate formality and informality. Put differently, variation in government effectiveness, regulatory consistency, and the perceived legitimacy of state authority conditions the opportunity structure within which entrepreneurs act, even when it is not modelled as the principal independent variable. This is particularly relevant in Kyrgyzstan, where recent World Bank analysis notes a weakening in

indicators such as government effectiveness, regulatory quality, and control of corruption, while businesses continue to cite informality as a major constraint. The point is therefore not that one setting is simply "more formal" than the other, but that the quality, coherence, and reach of state regulation differ in ways that affect how costly, credible, and useful formality appears to entrepreneurs.

A further reason why contextualisation is necessary concerns digital transformation. In both countries, digitalisation should not be read solely as an effect of the COVID-19 pandemic. The pandemic was an accelerator, but it interacted with pre-existing processes of technological diffusion, state digitalisation, and changing business practices. In Kazakhstan, for example, the OECD notes that the Digital Kazakhstan strategy, launched in 2018, had already helped develop a comprehensive digital government system and the legal-regulatory conditions for the digital transition of the economy before the pandemic, even though business uptake remained uneven and limited, especially among smaller firms. This is important for the interpretation of the third study: the digital adaptations observed among micro-entrepreneurs during COVID-19 were not created from scratch by the crisis, but emerged at the intersection of a broader digital transition and a specific shock that made those tools more urgent and commercially salient. The pandemic should therefore be understood less as the sole cause of digital transformation than as a catalyst that intensified, compressed, and reoriented ongoing processes of digital adoption in Central Asia (OECD, 2021, 2023).

Finally, the post-Soviet context is marked by a persistent tension between the symbolic value of formality and the practical durability of informal coordination. Soviet and post-Soviet institutional legacies placed strong emphasis on documentary compliance, organisational registration, and visible adherence to official procedures. Yet, as the literature on post-Soviet informality has shown, substantive economic and social coordination has often continued through unwritten norms, personal ties, reciprocity, and off-record arrangements (Aliyev, 2015; Morris, 2019; Polese, 2021). This helps explain why formal registration and informal practice frequently coexist rather than exclude one another. In such settings, informal practices can serve not only economic purposes, but also protective and organisational ones: they allow entrepreneurs to negotiate selective enforcement, reduce exposure to bureaucratic arbitrariness, and preserve room for manoeuvre in environments where formal institutions may be experienced as intrusive, inconsistent, or unevenly applied. Framed this way, informality is not simply the absence of formality, but part of a broader repertoire of navigating state power in everyday economic life. That insight is important throughout this thesis, because it clarifies why entrepreneurs may seek formal recognition instrumentally while continuing to rely on informal practices for flexibility, trust-building, and autonomy.

The next chapter sets out the methodological approach used to investigate these three research questions across the mixed-methods design of the thesis.

2 Methodology

This section outlines the methodological foundation for investigating the phenomena of IE and SMEs innovation in business environments characterised by informality. It starts from a philosophical rationale that situates IE research within a critical realist ontology and interpretivist epistemology, followed by an account of how axiological commitments inform ethical and reflexive considerations. The section then presents a mixed methods research design that blends empirical inquiries conducted using surveys, interviews, and observations. It elaborates on the data collection procedures that draw on classical and contemporary scales. These analytical frameworks incorporate statistical and thematic techniques and strategies to address issues of validity, reliability, and generalizability.

1.1 Research Philosophy: Ontological and Epistemological Stance

This thesis was grounded in a critical realist ontology combined with a pragmatic epistemology. At the ontological level, I assumed that economic and social phenomena such as the informal economy, informal entrepreneurship, and informal competition in Kazakhstan and Kyrgyzstan possess a real underlying existence, even if they are not directly observable and are only partially captured by official statistics or actors' narratives. Informal practices, such as tax evasion, envelope wages or unregistered employment are not merely discursive labels; they correspond to concrete patterns of action, institutional arrangements, and power relations that shape firms' opportunities and constraints. At the same time, critical realism recognises that these phenomena are mediated by social meanings, norms, and institutional contexts, and therefore cannot be reduced to objective "facts" that are simply recorded without interpretation. Applying this perspective means treating informality as a set of real causal mechanisms (e.g. informal competition, trust in institutions, tax law enforcement) that must be understood from imperfect indicators and narratives, rather than directly observed, and analysing how these mechanisms are differently perceived, justified and enacted by entrepreneurs.

Such an ontological stance is especially appropriate in the Kazakh and Kyrgyz context, where the boundary between formal and informal economic activity is fluid and embedded in historically specific legacies of post-socialist transition, and contemporary state–business relations (Morris, 2019). What counts as "informal" is influenced by entrepreneurs' and consumers' perceptions of fairness, state capacity, and everyday practices of rule negotiation (Salvi et al., 2022). A critical realist ontology allows me to treat informality and innovation both as real structures and mechanisms (e.g. tax regimes, regulatory burdens,

competitive pressures) and as socially constructed categories that actors continuously interpret and renegotiate.

Epistemologically, I adopted a pragmatic stance. Pragmatism starts from the assumption that no single method or type of data can fully capture complex socio-economic phenomena. Instead, knowledge is evaluated in terms of its usefulness for answering concrete research questions and solving empirical puzzles, rather than its adherence to a single, rigid philosophical position. In this sense, the thesis accepts that our knowledge of IE and innovation in informal business environments is always partial, situated, and fallible, but can be progressively improved by mobilising different forms of evidence and by iterating between theory and data.

Adopting a pragmatic epistemology means treating methods as tools chosen for their usefulness in answering concrete research questions, rather than out of allegiance to a single methodological tradition. This stance justified the mixed-method, multi-article design of the thesis. Each article included in this thesis mobilised a different type of data and analytical strategy to illuminate a distinct facet of the same overarching phenomenon. The first article (Polese et al., 2023) develops and applies a quantitative measurement approach to the Kyrgyz shadow economy, using secondary indicators and modelling strategies to estimate the size and dynamics of informal economic activity at the macro level. This provided a broad, system-level picture of how pervasive informality is in one Central Asian context. The second article (Aguzzi et al., 2024) moves to the meso level by using firm-level survey data from Kazakhstan to examine how perceived informal competition affects SMEs' innovation outcomes. Here, statistical techniques were employed to identify patterns and associations between informal pressure and different types of innovation that would not be visible from qualitative accounts alone. The third contribution (Aguzzi, 2024) shifts to a micro and process perspective: drawing on qualitative evidence from semi-structured interviews, it explores how micro-entrepreneurs in Kazakhstan digitally adapt their businesses in times of disruption, focusing on meanings, practices and sequences of action.

Taken together, this pragmatic, mixed-methods design allowed me to connect macro-level patterns of informality, firm-level responses to informal competition, and micro-level accounts of digital adaptation into a coherent explanation of how informality and innovation interact.

A critical realist–pragmatic perspective allowed me to bridge quantitative and qualitative approaches. It is assumed that different methods provide complementary windows on the same underlying phenomena: macro-level estimates help to situate the scale and trajectory of informality; firm-level surveys reveal how informal competition relates to innovation behaviour; and

qualitative accounts shed light on how entrepreneurs experience, normalise, or contest informality and digitalisation in their everyday practices.

Methodologically, this viewpoint influenced the research process as follows:

- Plurality of evidence: the thesis purposely integrates secondary statistics, survey data, and qualitative materials, each chosen because it is appropriate for the specific research question and level of analysis, following the mixed method research approach, which combines statistical trends (close-ended) with personal experiences (open-ended) to provide collective strength and reach a better understanding of the research problem (Creswell, 2015).

- Iterative theory–data relationship: theory does not simply precede data collection; instead, existing conceptual frameworks on informality and innovation guide the initial design and analysis, and empirical findings from Kazakhstan and Kyrgyzstan were then used to refine, challenge, or extend these frameworks. In this sense, the study followed an iterative movement between abstract concepts and concrete evidence, where observations inform theory-building and revised theories redirect further data collection and analysis. This back-and-forth was consistent with a critical realist concern for uncovering underlying mechanisms and a pragmatic emphasis on practically useful explanations (Dubois & Gadde, 2002; Tavory & Timmermans, 2014).

- Context sensitivity: while the thesis aimed to contribute to broader debates on informality and innovation under informal sector competition, its philosophical underpinnings highlight the importance of contextual embeddedness. The Central Asian setting was not treated as a neutral backdrop but as constitutive of how informality is organised, justified, and experienced by entrepreneurs and economic actors.

1.2 Mixed Methods Research Design

In line with the critical realist ontology and pragmatic epistemology outlined above, I chose a mixed method design to comprehensively investigate the link between informality and innovation in Kazakhstan and Kyrgyzstan. From this standpoint, different methods were treated as complementary tools for accessing a complex, partially observable reality, rather than as mutually

exclusive paradigms. Given the aim of the research, relying on a single method would be insufficient for capturing the full picture of this phenomenon. Quantitative methods can identify broad patterns or correlations (e.g. whether firms facing informal competition are more likely to innovate), but they may not explain the underlying reasons or processes. Qualitative methods can uncover rich detail on motivations and mechanisms, yet they typically involve small samples that limit generalizability. By combining both, the research leverages the strengths of each approach to overcome the other's weaknesses. In general, mixed methods research "combines the strengths of quantitative and qualitative data to provide the best understanding of a research problem" (Creswell and Creswell, 2018).

The justification for using mixed methods was thus grounded in our ontological and epistemological standpoint, as well as the nature of the research question and prior literature. Studying informality and innovation benefits from multiple lenses: a positivist, econometric lens to test hypotheses about "if" and "to what extent" informal pressures relate to innovation, and an interpretivist lens to understand "how" and "why" entrepreneurs navigate those pressures because each perspective alone would only reveal part of the story. As Patton (2002) argues, complex social phenomena are often best understood by combining in-depth inquiry with analysis of broader regularities, an approach that fits the goal of explaining both whether and how informality shapes innovation and digital adaptation.

More precisely, the thesis employed a sequential multi-phase mixed methods design, following the logic of an explanatory sequential strategy (Creswell and Creswell, 2018). The design was chosen over alternative single method approaches for three main reasons. First, the research aims required moving from a broad understanding of the extent and structure of informality to firm-level patterns of response, and finally to micro-level processes of entrepreneurial adaptation. A sequential structure mirrors this logic of inquiry: macro-level measurement results informed the specification of the firm-level analysis, and both quantitative phases then motivated and framed the in-depth qualitative exploration. Second, a purely quantitative design (for example, relying only on firm-level survey data) would have allowed identification of associations between informal competition and innovation, but would have been poorly equipped to unpack how entrepreneurs themselves interpret and navigate informality and digital adaptation in practice. Conversely, a purely qualitative multiple-case design could have provided rich accounts of micro-entrepreneurs' strategies, but without the macro and meso phases it would be difficult to situate these narratives within the wider prevalence and patterns of informality in Kazakhstan and Kyrgyzstan. The choice of a three-phase sequential structure, with each phase corresponding to one of the thesis contributions, was therefore particularly suited to the critical realist–pragmatic stance adopted: each phase

addressed a different analytical level (macro, meso, micro), employed a distinct methodological strategy (quantitative measurement, econometric modeling, qualitative exploration), and cumulatively refines the theoretical understanding of how informal norms, informal sector competition, and crisis contexts shape entrepreneurial adaptation and innovation. The integration of these phases produced a richer, more contextually grounded account than a mono method study could achieve (Table 2).

The mixed-methods design also reflects a theory–method fit logic rather than a simple accumulation of techniques. Following Gehman et al. (2018), the thesis aligns each empirical approach with the kind of claim being made: the first study uses direct survey-based measurement to interrogate the conceptual and empirical limits of binary shadow-economy estimations; the second uses firm-level survey data and econometric modelling to analyse patterned relationships between informal competition and innovation; and the third mobilises qualitative interviewing to capture process, meaning, and adaptation in a setting where sequential decisions, ambiguity, and hybrid practices are central. In this sense, methodological pluralism is used to match the level and form of the theoretical argument, not to compensate for conceptual weakness.

Phase	**Purpose**
Phase 1: Macro-Level Quantification and Conceptual Reframing (Polese et al., 2023)	To empirically measure the scale of informality in Kyrgyzstan and conceptually challenge the formal/informal binary by grounding the shadow economy in social norms and lived realities.
Phase 2: Meso-Level Causal Mechanisms and Behavioural Effects (Aguzzi et al., 2024)	To examine how the intensity of informal sector competition affects SMEs' innovation and investment behaviour in Kazakhstan, using a **quantitative multivariate and machine-learning-based analysis.**
Phase 3: Micro-Level Lived Experience and Crisis Adaptation (Aguzzi, 2024)	To explore how semi-formal micro-entrepreneurs in Kazakhstan adapted to the COVID-19 crisis using digital tools, and how this shaped innovation practices and regulatory positioning.

Reasoning
This foundational phase provides both empirical benchmarking and conceptual rethinking of informality. Using the Putniņš & Sauka direct survey method, it quantifies the shadow economy' s scale in Kyrgyzstan and contextualizes it through firm-level perceptions of state trust, compliance, and informal norms. By revealing informality as a continuum of embedded practices rather than a binary state, it redefines the problem space. Engaging a national sample, this phase fulfils a diagnostic role: it exposes paradoxes like simultaneous compliance and evasion, and prompts the need for deeper behavioural inquiry, which the next phases address.
Building on Phase 1, this phase investigates how informal competition affects innovation in formal SMEs, addressing whether informality always harms firms or can also catalyze innovation. Using Kazakhstan BEEPS data and a combination of logit regression and CART analysis, it tests non-linear causal relationships that qualitative methods alone cannot capture. By shifting from Kyrgyzstan to Kazakhstan, it adds a contextual contrast in institutional environments. This phase deepens the analysis by examining how informality influences firm behavior and transitions the focus from macro-level patterns to meso-level strategic responses.
This phase adds qualitative depth and contextual richness, focusing on the micro-level experiences of entrepreneurs operating in the gray zones of informality identified in Phases 1 and 2. Using the COVID-19 crisis as a natural experiment, it explores how entrepreneurs adapted through digitalization, partial formalization, and innovation, drawing on semi-structured interviews and thematic analysis. It also shows how informal norms shift in real time and how state measures (e.g. moratoriums, digital policies) shape compliance and transformation. This phase validates and humanizes earlier findings: Phase 1' s concept of semi-formality is embodied in selective online compliance, while Phase 2' s innovation under pressure is mirrored in real-world digital pivots. By foregrounding entrepreneurial agency, it grounds the thesis' s policy relevance in lived realities.

Table 2: Overview of the Three-Phase Mixed-Methods Design

The qualitative phase was designed explicitly to explain and contextualise the quantitative findings, following an explanatory sequential mixed-method design. Evidence from the successive phases was integrated in the cover paper to develop a coherent account of informality–innovation dynamics: the surveys establish the prevalence and direction of key relationships across a broad set of firms, while the interviews unpack the underlying mechanisms by clarifying how entrepreneurs interpret constraints, make trade-offs, and enact informal and innovative practices in everyday operations. This sequencing enhances both breadth and depth and follows established guidance on mixed-method integration and complementarity (Creswell & Creswell, 2018), making it particularly appropriate for the thesis aim of explaining how informality shapes innovation and digital adaptation in the Central Asian context.

1.2.1 Setting selection: Rationale for Kazakhstan and Kyrgyzstan

This research focuses on Kazakhstan and Kyrgyzstan as the comparative context for studying informality and innovation in small enterprises. These two Central Asian countries were selected based on both theoretical relevance and practical considerations. Theoretically, Kazakhstan and Kyrgyzstan provide a compelling contrast that can illuminate how differing economic and institutional environments impact the informality–innovation relationship. Practically, both countries were accessible to the researcher through collaborations and prior data collection efforts from supervisors (e.g. the manager survey project), which facilitated the multi-phase study design.

Both Kazakhstan and Kyrgyzstan are former Soviet republics that transitioned to market economies in the early 1990s, and in the decades since, both have been characterised by extensive informal economic activity. Estimates consistently indicate that a significant share of economic output occurs in the informal/shadow sector in these countries. For instance, Kyrgyzstan's shadow economy was estimated to be around 30% of GDP in the mid-2010s, and Kazakhstan's informal sector, while somewhat lower as a proportion of its larger GDP, remains substantial (various estimates often ranging between 20–30%). Such high levels of informality make these countries ideal for studying the phenomenon's effects: there is sufficient variation and prevalence of informality to observe its interplay with business innovation. By contrast, in economies with very low informality, the research question would be less pertinent. In addition, these two countries contribute to the broader understanding of how post-socialist contexts deal with informality, complementing research done in other former Soviet regions.

Fieldwork is valuable to this thesis not only as a means of access, but as a source of contextual and interpretive depth. The author's prior experience in Kazakhstan and Kyrgyzstan, familiarity with Russian, and long-term engagement with regional business environments made it possible to situate survey patterns within lived market practices, thereby strengthening the contextual grounding of the study in line with calls to incorporate context more explicitly in organisational research (Johns, 2017). A practical reason for setting selection was dictated both by the author's prior professional experience in the countries before commencing his doctoral studies and by his subsequent affiliation with KIMEP University in Almaty, which facilitated access and organisation of the fieldwork, and ensured the availability of data and collaborators. Moreover, the author is enrolled in the EU-funded MARKETS doctoral programme, which was specifically established to study the informal economy in the former Soviet space and deepen understanding of the region's business environment. This project is therefore fully aligned with MARKETS' core objectives. The manager survey implemented in Kyrgyzstan provided a unique dataset to leverage, and

Kazakhstan's participation in the Enterprise Surveys provided high-quality firm-level data for analysis. Moreover, the research team had language skills (Russian, Kazakh) and regional expertise for conducting interviews and interpreting results in both countries. The Russian-speaking author's involvement, for example, brought direct field experience in both Kazakhstan and Kyrgyzstan's entrepreneurial scenes, ensuring culturally informed data collection. These factors made the ambitious mixed methods design feasible across two countries.

1.2.2 Sampling Strategies

Each study applied a distinct sampling strategy aligned with its research question and empirical context. For the first article, a stratified random sample of formal firms in Kyrgyzstan was drawn, covering all regions, sectors and firm-size classes (from micro to large enterprises). Stratification by sector and size ensured that the resulting sample reflected the structure of the formal economy, which was necessary to produce reliable estimates of the shadow economy at the national level. Targeting owners and top managers allowed the survey to capture firm-level information on under-reporting and informal practices that only decision-makers can reliably provide, while the focus on registered firms ensured consistency with official business registers and permitted comparison with macro statistics.

In the second article, the analysis relied on the existing World Bank Business Environment and Enterprise Performance Survey (BEEPS) 2018–2020 for Kazakhstan. This dataset is based on a stratified random sampling design implemented by the World Bank, yielding a nationally representative sample of formal SMEs across sectors and regions. Using BEEPS is justified on methodological grounds: it provides a large, high-quality probability sample with standardised questions on informal competition and innovation, which is appropriate for econometric analysis of associations between perceived informal pressure and innovation outcomes in Kazakhstan, a context characterised by high levels of economic informality. The qualitative sample does, however, carry identifiable sources of bias, which are acknowledged and addressed explicitly. Recruitment through a social-media advertisement introduced a degree of self-selection, likely making digitally engaged or more outward-facing entrepreneurs easier to reach than those operating more fully offline. To mitigate this, the sampling strategy sought variation in sector, business model, gender, and type of digital adaptation, rather than homogeneity or convenience alone. The aim was not statistical representativeness but analytic range: to capture contrasting configurations of semi-formality and adaptation across information-rich cases. Moreover, the thesis does not invoke saturation as a generic methodological ritual; rather, the sample size is justified by the focused scope of the inquiry, the recurrence of key themes across interviews, and the bounded ambition of the

study to illuminate mechanisms rather than exhaust the full population of Kazakh micro-entrepreneurs (Moore et al., 2026).

For the third contribution, a purposeful sampling strategy was adopted to select micro-entrepreneurs in Kazakhstan who had navigated the disruptions of the COVID-19 crisis. To be included, firms had to fulfil two criteria: (1) fall under the category of micro-enterprise (micropredprinimatel, individualny predprinimatel), with fewer than ten employees registered, and (2) operate within the territory of the Republic of Kazakhstan. Participants were identified and recruited because they met specific criteria aligned with the research aim: running very small, often semi-formal businesses; experiencing significant disruption during the pandemic; and having engaged in some form of digital adaptation (e.g. online selling, social media marketing, digital payments). Rather than seeking statistical representativeness, this strategy aimed to assemble a small set of information-rich cases that could illuminate diverse patterns of digital adaptation and innovation among micro-entrepreneurs operating in informal or semi-formal conditions.

1.2.3 Data Collection Methods

For the first article, primary data were gathered through a structured questionnaire administered via phone interviews. A structured instrument was chosen because the aim was to produce quantitative, comparable indicators of shadow-economy participation across a large firm sample, in line with the Putniņš and Sauka direct survey method. Closed and standardised questions allowed responses to be converted into numerical measures suitable for modelling the size of the shadow economy, while reducing interviewer variation and interpretation. Telephone administration (March–May 2019) enabled coverage of firms across Kyrgyzstan at reasonable cost and, importantly for a sensitive topic, created a degree of distance that can reduce social desirability bias compared to face-to-face interviews. Interviews lasted about five minutes each and included four sections: (1) external influences and government policy satisfaction, (2) shadow economic activities, (3) company/owner characteristics, and (4) entrepreneurs' attitudes. Given the sensitivity of shadow-economy questions, additional procedures were employed to improve data reliability: the survey was introduced as a study of policy satisfaction rather than tax evasion, questions about misreporting were phrased indirectly (e.g. asking about "firms like yours" rather than the respondent's own firm), respondent identities were kept confidential, and obviously inconsistent responses were excluded. These design features draw on prior methodological work showing that indirect questioning within a structured survey format can encourage more truthful disclosure on hidden behaviours (Putniņš & Sauka, 2020).

For the second article, secondary data from the Business Environment and Enterprise Performance Survey (BEEPS) 2018–2020 for Kazakhstan were used. BEEPS is a standardised World Bank/EBRD survey that employs a structured questionnaire administered in face-to-face interviews with firm managers by trained enumerators, following a harmonised protocol across countries. Using this existing survey instrument is justified on both quality and feasibility grounds. First, the BEEPS questionnaire includes validated blocks on competition (including competition from informal firms) and on firms' innovation activities, providing precisely the variables required to examine the relationship between perceived informal competition and innovation outcomes in formal Kazakhstani SMEs. Second, its large-N, nationally representative design and standardised administration procedures offer a level of coverage and measurement consistency that would be difficult to replicate within the scope of this doctoral project. The study therefore builds on an established, high-quality survey instrument rather than designing a new firm-level questionnaire from scratch. A limitation of relying on BEEPS is that it captures only formally registered firms and is based on self-reported perceptions rather than direct observation of competitors. For the purposes of this thesis, this is analytically appropriate because the second study examines how formal SMEs perceive and respond to informal competition, not the full ecology of informal firms themselves. Nonetheless, this also means that the results should be interpreted as evidence about formal firms' strategic responses under perceived informal pressure, rather than as a full account of the entire market.

For the third contribution, data were collected through semi-structured interviews with 12 micro-entrepreneurs in Kazakhstan. This type of interview was chosen because the research aim was to explore processes, meanings and sequences of adaptation during the COVID-19 crisis, while still ensuring that core topics (e.g. changes in business model, use of digital tools, perceptions of regulation and informality) were covered systematically across participants. Suitable interviewees were identified via an advertising post on social media, to which micro-entrepreneurs voluntarily responded. The interviews were conducted online between 4 and 20 September 2022, a timing that allowed participants to reflect on their digital and organisational responses to the pandemic while experiences were still relatively recent. The semi-structured interview data provide in-depth qualitative evidence on digital adaptation and innovation among very small, often semi-formal businesses, complementing the survey-based evidence from the first two studies and aligning with the thesis aim of understanding how informality and crisis conditions shape entrepreneurial adaptation. A further methodological consideration concerns the qualitative strategy. Semi-structured interviews were selected because the study sought to understand process, sequencing, and interpretation rather than to generate statistically generalisable estimates. This approach is therefore consistent with the explanatory aim of the third study, which is to show how entrepreneurs

made sense of disruption, adjusted routines, and combined formal and informal practices over time, rather than to test a closed set of variables in isolation.

1.3 Data Analysis Approaches

For the first study, a quantitative analytical strategy was pursued, centred on computing a composite Shadow Economy Index from the survey responses. A composite index was appropriate because the aim was to obtain a single, comparable macro-level measure of the shadow economy that could be related to other countries and studies using the Putniņš & Sauka approach. The calculation proceeded in three steps: first, for each firm, the extent of underreporting was estimated in two components – employee remuneration (envelope wages and unreported workers) and corporate operating income – based on specific survey questions. Next, each firm's "shadow production" was computed as a weighted average of those two underreported components, with weights reflecting their normal share in GDP (labour vs. corporate income). Finally, averaging across all firms (weighted by output) yielded a national shadow economy index for Kyrgyzstan. This systematic quantification was necessary to move beyond anecdotal statements about informality and to provide empirically grounded benchmarking. In addition, descriptive and inferential analyses (e.g. comparisons across sectors, firm sizes, and attitudinal correlates of underreporting) were conducted to interpret patterns in the data. These supplementary analyses are justified because they help to validate the index and to identify which parts of the economy and which attitudes are most strongly associated with hidden activity, thereby generating questions for the subsequent phases.

In the second article, a statistical modelling strategy was adopted to test hypotheses on informal competition and innovation at the firm level. Logistic regression was used to predict the likelihood of a firm engaging in product or process innovation based on whether it perceives competition from informal firms and on a set of control variables. Logistic regression is suitable here because the main outcomes are binary (innovator vs. non-innovator) and the objective is to estimate the direction and strength of associations, while controlling for other firm characteristics. Alongside the logistic models, classification tree analysis (CART) was applied to uncover potential non-linear effects and interaction patterns that are difficult to detect and interpret using regression alone. Classification trees are justified in this context because they provide a visual, rule-based representation of how different combinations of factors (e.g. intensity of informal competition, firm size, export status) segment firms into groups with different innovation probabilities. Using both methods in R (logit and CART) enables the analysis to combine the parsimony and inferential

power of regression with the pattern-discovery and configurational insights of tree-based modelling, which is aligned with the thesis aim of exploring whether informal competition can sometimes stimulate, rather than only hinder, innovation.

The third contribution adopted a qualitative analytical approach based on thematic analysis of semi-structured interviews. The focus here was on understanding how micro-entrepreneurs in Kazakhstan adapted during the COVID-19 crisis, what digital strategies they employed, and how they interpreted their changing regulatory and market environments. Thematic analysis was chosen because it allows systematic identification of recurring patterns (e.g. adoption of e-commerce, diversification of products, intensive use of social media, selective formalisation) while remaining open to unexpected themes emerging from participants' narratives. The analytical process involved coding interview transcripts for key innovations, challenges and perceived institutional changes, comparing themes across the 12 micro-entrepreneurs, and situating these findings within the broader trends of Kazakhstan's digital transformation. Given the manageable number of cases, the analysis was conducted manually, which facilitated close engagement with each narrative and iterative refinement of codes and themes. The outcome is a rich, contextually grounded narrative synthesis rather than numerical estimates, providing insight into mechanisms—such as how digital tools enabled business continuity, or how informal norms shifted during the crisis—that cannot be captured through survey data alone and that help to interpret the quantitative patterns identified in the earlier studies.

Table 3 summarizes and compares the core methodological features of the three studies (sampling, data collection, and analysis):

Methodological Aspect	Article I	Article II	Article III
Sampling Strategy	Random stratified sample of formal firms (owners/top managers) in Kyrgyzstan, Russia, and Ukraine; included all sectors and sizes. Justified by need for direct measurement of shadow economy at firm level. Sample drawn from national business registers (registered companies), implicitly excluding illicit/unregistered firms.	Secondary data sample from BEEPS 2018–2020 (Kazakhstan). BEEPS uses stratified random sampling of SMEs nationally. Kazakhstan was chosen deliberately due to its high informality, making it an insightful case for study. The sample comprises formal SMEs that reported on competition and innovation in the survey.	A non-probability, criterion-based purposive sampling strategy was used: firms had to (1) fall under the category of microenterprises (micropredprinimatel, individualny predprinimatel), with fewer than 10 registered employees, and (2) operate within the territory of the Republic of Kazakhstan. Eligible interviewees were recruited through an advertising post on social media, to which microentrepreneurs voluntarily responded, implying a degree of self-selection.
Data Collection	Structured questionnaire administered via phone interviews in March–May 2019. Survey covered perceptions of policy, shadow activities, firm characteristics, etc.	Archival survey data from BEEPS (World Bank/EBRD). The data were collected by BEEPS staff (through standardized face-to-face surveys of firm managers). Key measures include whether firms see informal competitors and whether they introduced product or process innovations. The study did not involve new data collection; it utilized the existing 2018–2020 data set with all variables of interest extracted from the BEEPS questionnaire.	Qualitative data gathered through semi-structured interviews of 12 selected microentrepreneurs. Data were collected over ~2 years post-COVID 19 crisis onset, capturing real-time adaptations.
Data Analysis	Computed a Shadow Economy Index (% GDP) from survey data using a multi-step formula (firm-level underreporting, GDP weighting, aggregation). Ran descriptive comparisons (country/sector/firm size) and correlation analysis (e.g., tax morale vs. shadow activity). Results are reported as % and trends for 2017–2018.	Logistic regression and classification trees tested whether perceived informal competition predicts innovation, controlling for other factors. Logistic models yielded odds ratios; trees revealed interaction and non-linear patterns. Analyses were run in RStudio, producing estimates and firm segmentation.	Qualitative thematic analysis of case narratives. The chapter synthesizes common innovative strategies (e.g. pivot to online sales, new product lines, digital marketing) employed by micro-entrepreneurs. Interview transcripts/notes were coded for key themes, but analysis remained narrative and explanatory. An interpretive account of how each case exemplifies broader trends in digital transformation and entrepreneurial innovation was presented.

Table 3: Comparison of sampling, data collection, and analysis methods in the three contributions.

1.4 Ethical Considerations

The doctoral studies were designed and conducted with particular attention to ethical standards, given the sensitivity of studying informal economic activities and the use of human participants. All participants were informed about the purpose of the study, the voluntary nature of participation, the topics to be discussed, and their right to refuse any question or withdraw at any time. Consent was obtained in writing or via recorded verbal consent for qualitative interviews, and orally at the beginning of the Kyrgyzstan manager survey. The Kazakhstan Enterprise Survey data were used in anonymised form and in line with World Bank/EBRD data-use conditions, with no attempt to re-identify firms.

Confidentiality and anonymity were strictly safeguarded. No personal names were collected in the Kyrgyz survey; firm identifiers were separated from responses and remain confidential. In qualitative interviews, all names and potentially identifying details were replaced with pseudonyms or broader descriptors, and audio files and transcripts were stored on encrypted drives accessible only to the researcher. Given the potential reputational or legal risks of discussing shadow or informal practices, questions in both surveys and interviews were framed to elicit general behaviours and perceptions (e.g. how "businesses like yours" operate) rather than direct admissions of wrongdoing, and any sign of discomfort from participants resulted in changing the topic or going off record.

The overall research design, including consent procedures and data handling, was reviewed and approved by the ethics committee of Tallinn University of Technology. Local partners in Kyrgyzstan and Kazakhstan were consulted to ensure cultural appropriateness and compliance with local norms and regulations. Quantitative data are reported only in aggregate form, qualitative data are stored without direct identifiers and will be destroyed after the institutional retention period. Throughout the thesis, findings are reported transparently, limitations are acknowledged, and all sources are properly cited, upholding integrity and honesty in analysis and interpretation.

3 Results

This chapter presents the key findings of the thesis as an integrated answer to the overarching question and the three sub-questions. Each subsection synthesises only the essential empirical patterns and shows how the macro (conceptualisation/measurement), meso (SME strategy), and micro (entrepreneurial adaptation) results jointly explain how informality shapes innovation and adjustment under institutional uncertainty.

1.5 RQ1: Re-theorizing Informality Beyond the Formal–Informal Binary (Macro-Level)

Why should the notion and measurement of the informal economy in post-Soviet contexts be reconceptualised to capture lived practices rather than relying on binary formal–informal distinctions?

The first study demonstrates that, in Kyrgyzstan, informality is not well captured by a formal-informal dichotomy. Using the Putniņš and Sauka direct manager survey method, the shadow economy is estimated at 46.1% (2017) and 44.5% (2018) of GDP, indicating that underreporting and off-the-books practices constitute a mainstream mode of economic organisation rather than a marginal "underground" sphere.

Crucially, the survey evidence shows that many firms operate semi-formally: they are registered and comply selectively, while simultaneously engaging in underreporting, dual accounting, envelope wages and informal side-payments. These patterns are closely linked to low institutional trust and dissatisfaction with state support, suggesting that informality often functions as a pragmatic response to perceived corruption, administrative burdens, and weak public services. Entrepreneurs report using personal networks, community norms, and small-scale corruption to "get things done" when formal channels are slow, unpredictable or costly, this resonates with broader post-Soviet accounts of informal governance and network-based problem-solving (e.g., Ledeneva, 1998, 2006; Morris & Polese, 2013). The findings therefore motivate a clearer analytical separation between shadow economy, intended as a measurable monetary outcome, and informality, that is the broader repertoire of practices, norms, and relational mechanisms that produce those monetary outcomes. Within this continuum, semi-formal behaviour becomes the modal case rather than an exception: firms maintain enough formal presence to access certain benefits (e.g. contracts, legitimacy) while relying on informal practices for flexibility and cost management.

The evidence, with its very high shadow economy share and widespread tolerance for minor corruption, captures this hybrid order. It also aligns with recent scholarship that frames the informal economy as a "normal" feature of many developing and post-socialist markets, not a pathological deviation (Banks et al., 2020; Simba et al., 2023). In this perspective, informality constitutes an institutional order in its own right – a web of norms, networks and practices that coordinates exchange when formal rules are thin, distrusted or selectively enforced (Ault & Spicer, 2022; Williams & Nadin, 2014).

These findings provide the conceptual foundation for the thesis: entrepreneurs navigate uncertainty by moving along a continuum of formality, combining compliance and rule-bending inside the same firm. This macro-level hybrid order sets the conditions under which informality can become not only a constraint but also a resource for adaptation and innovation in the studies that follow.

1.6 RQ2: Informal Competition as a Driver of SME Innovation? (Meso-Level)

How does the intensity of informal-sector competition influence SMEs' product and process innovation, as well as their investment decisions, in Kazakhstan?

The second study shows that informal competition is not only pervasive but also a significant and nuanced driver of innovative behaviour among Kazakh SMEs. Using BEEPS data (2018-2020) for 1,094 SMEs, firms exposed to informal competitors (unregistered or rule-evading businesses) exhibit a higher likelihood of innovation than firms not reporting such pressure, controlling for standard innovation determinants. The key pattern is non-linear: innovation is most strongly associated with moderate-to-major informal competition, suggesting an "escape" response in which formal SMEs upgrade to defend market position (e.g., differentiating offerings and improving efficiency).

The results also show differentiated innovation pathways. Under rising informal pressure, SMEs tend to combine product innovation (differentiation away from price competition) with process innovation (cost and efficiency improvements). However, when informal competition is perceived as very severe, the positive association with innovation weakens. This suggests that beyond a certain threshold, competitive pressure no longer stimulates upgrading but instead constrains it: firms may face reduced margins, heightened uncertainty, and limited managerial attention, which make longer-term innovation investments more difficult to sustain. Under such conditions,

attention is more likely to shift from product or process upgrading toward immediate operational adjustment and business continuity. Notably, the ability to convert informal pressure into innovation is conditioned by capabilities: investment in external knowledge and related inputs emerges as a key predictor and it shapes whether informal competition becomes a catalyst or a constraint. The results are embedded in a context where, as in the previous study, informal competition itself is widespread and normalized. Around 40% of SMEs in the Kazakh sample report informal competitors as an obstacle, and many consider their presence a routine feature of the market environment. In such a setting, the question is not whether formal firms will encounter informality, but how they respond to it. The evidence from Kazakhstan shows that a significant share of SMEs responds by upgrading and innovating, particularly at moderate to high levels of informal pressure, while very severe, pervasive informality risks pushing them into stagnation or exit.

These findings show a meso-level mechanism that links informality to innovation under uncertainty. Informal competition can reallocate managerial attention and investment toward upgrading, up to a threshold beyond which informality becomes innovation-supressing. This refines the thesis argument by identifying when informality act as a productive stimulus and when it becomes an overwhelming obstacle.

1.7 RQ3: Digital Adaptation of Semi-Formal Micro-Entrepreneurs in Crisis (Micro-Level)

How do micro-entrepreneurs adopt and adapt digital tools to sustain and transform their semi-formal business practices during a crisis (e.g. the COVID-19 lockdowns), and with what implications for innovation and regulatory compliance?

The third study draws on qualitative interviews and case-based evidence from very small, often semi-formal micro-enterprises in urban Kazakhstan during the 2020–2021 lockdowns. Prior to COVID-19, most operated through highly local, offline and cash-based routines, with limited record-keeping and varying degrees of semi-formality (e.g., simplified registration combined with underreporting, mixed household–business finances, and family labour) (Oka, 2015; Kredina et al., 2022). Lockdowns disrupted face-to-face trade and pushed entrepreneurs into rapid digital migration as a survival strategy. Social media and messaging platforms (notably Instagram, WhatsApp and Telegram) became core commercial infrastructures, enabling firms to maintain customer relations and, in many cases, expand beyond neighbourhood markets through delivery and remote ordering. This shift was accompanied by accelerated learning and skill

acquisition (often self-directed), and by a reorientation of decision-making toward platform metrics and online engagement.

Digital adoption also catalysed incremental, improvisational innovation in products, logistics and sourcing. Entrepreneurs reconfigured supply chains via national online networks rather than international due to border closures, adjusted offerings through continuous customer feedback, and experimented with new service formats (e.g., delivery-based or remote provision), consistent with frugal innovation dynamics under constraint (Igwe et al., 2020; Khattak et al., 2022).

Importantly, digitalisation reshaped, rather than resolved, the informality–formality relationship. On the one hand, online selling could extend semi-formal practices (e.g., hybrid payments, partial visibility of transactions). On the other hand, platform and logistics requirements, alongside scale and credibility concerns, nudged some entrepreneurs toward selective formalisation (e.g., registration, business accounts, more systematic records). Kazakhstan's temporary moratorium on inspections and related relief measures further reduced perceived enforcement risk and created space for experimentation.

Although these patterns were observed under crisis conditions, they are not necessarily confined to the pandemic period. The cases suggest that several mechanisms identified here—greater reliance on platform-based customer acquisition, more routinised digital communication, hybrid payment arrangements, and flexible reconfiguration of supply and delivery—may persist beyond crisis settings where uncertainty, volatility, and uneven institutional support remain characteristic of the business environment. What is likely to differ in non-crisis contexts is not the relevance of digital adaptation itself, but the pace and urgency with which entrepreneurs adopt and institutionalise such practices.

1.8 Overarching Research Question: Navigating and Leveraging Informality amid Uncertainty

How do entrepreneurs in Kazakhstan and Kyrgyzstan navigate and leverage informality to innovate and adapt amid institutional uncertainty?

Across the three studies, the thesis reaches the answer the overarching question by showing that entrepreneurs in Kazakhstan and Kyrgyzstan navigate institutional uncertainty through hybrid operating models, moving along a continuum rather than choosing between "formal" and "informal" as mutually exclusive states and business operating mode. At the macro level, informality is revealed not as a peripheral "shadow sector" but as a practice-based

institutional order: a shared repertoire of unwritten rules, reciprocity, networked problem-solving and selective compliance that becomes rational where formal governance is perceived as unreliable, costly, or inconsistently enforced. This is why many firms sustain a "front-stage" of basic registration and minimal compliance alongside a "back-stage" of flexible arrangements (e.g., partial reporting, informal labour, side-payments, network-based enforcement). Under uncertainty, such hybridity functions as a risk-management mechanism: it buffers volatility, reduces transaction frictions, and enables continuity of exchange when formal procedures are slow or untrusted.

Within this macro environment, the meso-level evidence specifies when and how informality becomes connected to innovation. The study on Kazakh SMEs' propensity to invest on innovation shows that informal-sector competition is not uniformly innovation-suppressing; rather, it acts as a conditional trigger that reallocates managerial attention and resources toward upgrading when the pressure is moderate or major. In these conditions, formally registered SMEs respond to rule-bending rivals by differentiating products and improving processes to defend market position—an "escape competition" dynamic that reframes informality from a pure drag into a competitive nudge. Yet the relationship is non-linear: when informal competition is perceived as very severe, the distortion of the playing field can overwhelm firms' capacity to invest, shifting attention from upgrading to short-term survival—consistent with the view that pervasive informality may lock firms into low-margin equilibrium and limit productivity-enhancing investment. In other words, entrepreneurs leverage informality-induced pressure for innovation only up to a threshold; beyond it, informality becomes a constraint that erodes the returns to innovation.

The micro-level study of DT among Kazakh micro-entrepreneurs deepens the argument by unpacking the mechanisms of rapid adaptation under shock, and by showing how digital tools reconfigure the formality–informality balance rather than resolving it. During the COVID-19 lockdowns, semi-formal micro-entrepreneurs leveraged the very features associated with informality—improvisation, flexible labour, quick reconfiguration, reliance on personal networks—to pivot rapidly into platform-mediated commerce and new operating routines. Social media and messaging apps became low-cost infrastructures for experimenting with logistics, customer relations, and product/service formats, accelerating bottom-up innovation under constraint. At the same time, digitalisation introduced a new institutional tension: it can enable informality to scale through peer-to-peer channels and partial visibility, but it can also increase traceability and create selective pathways to formalisation via platform requirements, payment systems, and credibility needs. The pandemic context—combined with temporary relief and enforcement moratoria—opened space for experimentation, allowing entrepreneurs to keep informal flexibility while formalising specific components that supported growth and reduced risk.

Finally, the thesis argues that entrepreneurs in Kazakhstan and Kyrgyzstan leverage informality as a strategic resource—for speed, cost management, access to opportunities, and problem-solving—while also using selective formalisation to secure legitimacy, scale, and access to digital infrastructures. The key contribution is therefore not the claim that informality is "good" or "bad" for innovation, but that its effects are contingent and cross-level: informality provides the institutional "operating system" that makes economic life workable under uncertainty; within that system, it can stimulate innovation when informal rivalry is strong enough to push firms to upgrade, and when they have the resources and skills to respond; but when rule-evading competitors dominate the market, margins shrink and uncertainty rises to a point where firms prioritise day-to-day survival over investing in new products or processes. These findings help explain why hybrid arrangements persist, how they shape innovation incentives, and why policy responses based solely on deterrence or blanket formalisation are likely to miss the underlying mechanisms through which entrepreneurs actually navigate uncertainty.

4 Contributions

This chapter synthesises how the thesis advances existing knowledge. Section 4.1 outlines the main theoretical contributions; Section 4.2 discusses practical and policy implications for entrepreneurs and decision-makers. Section 4.3 reflects on the study's limitations, while Section 4.4 identifies avenues for future research. Section 4.5 concludes the chapter with conclusive remarks regarding the doctoral thesis as a whole.

1.9 Theoretical Contributions

This thesis advances research on informality, entrepreneurship, and innovation through three interconnected theoretical contributions that jointly reframe how entrepreneurial action is understood under institutional uncertainty. First, it reconceptualises informality not as a residual "underground sector," but as a pervasive institutional order and behavioural continuum through which economic life is routinely organised when formal rules are costly, inconsistently enforced, or lack legitimacy and trust. Building on direct survey-based measurement approaches and the broader informality literature, the thesis introduces a fundamental distinction between key conceptualisations of the informal economy (Dell'Anno, 2022; Webb et al., 2009; Williams & Bezeredi, 2018). This distinction clarifies why macro estimates of "shadow GDP" are informative yet incomplete: they capture the monetised output of concealment, but not the institutional conditions and social logics that make semi-compliance normal and, in many contexts, rational. The thesis thus strengthens institutional explanations by foregrounding institutional asymmetry—misalignments between formal rules and locally legitimate norms—as a mechanism sustaining semi-formal behaviour (Aliyev, 2015; Williams & Horodnic, 2015; Morris & Polese, 2013).

Second, the thesis re-specifies the relationship between informal competition and innovation by introducing an attention-based mechanism: what matters is not simply whether informal competitors exist, but how the intensity of that pressure reshapes managerial priorities and resource allocation. The prevailing assumption in policy and management discourse is that informal rivals primarily erode incentives to invest and innovate by undercutting prices. The evidence collected here challenges that linear view. Under moderate-to-high informal competitive pressure, many formally registered SMEs respond by upgrading, introducing new products, improving processes, and investing in efficiency, because innovation becomes a route to differentiation and operational resilience when price competition is distorted by non-compliance (Ocasio, 1997; Hlioui et al., 2022). Yet when rule-evasion becomes pervasive enough to compress margins and increase uncertainty, firms frequently redirect attention away from

longer-term upgrading and toward short-term coping, delaying or freezing innovation investment. This conditional mechanism helps explain why prior research reports mixed effects of informality on firm performance and innovation (Vlachos, 2024).

Third, the thesis extends DT debates by showing how semi-formal micro-entrepreneurs enact rapid digital adaptation and innovation under crisis conditions, and how this reconfigures, rather than resolves, the formality–informality relationship. The thesis shows how very small businesses in emerging-market urban contexts adopt low-cost tools (social media, messaging apps, platform-mediated delivery and payments) through bricolage, trial-and-error, and peer learning, producing incremental but consequential changes in business models, logistics, and customer relations (Leonardi, 2020; Atiyas & Dutz, 2021; Khattak et al., 2022). Importantly, platforms are conceptualised as quasi-formal infrastructures: they can increase traceability and standardisation via payment rails, reputation signals, and transaction records, while still allowing semi-formal practices to persist through hybrid payment routines and selective reporting (Lakemann & Lay, 2019; Peña et al., 2024). The result is an institutionally grounded account of digital change that links digital adoption directly to the informality–innovation nexus, without presuming a simple transition from informal to formal.

Taken together, these contributions suggest a coherent theoretical advance: in Kazakhstan and Kyrgyzstan, informality is treated not as a residual sphere external to the formal economy, but as a historically embedded and relational mode of coordination that operates along a continuum of practices; informal competition is shown to shape innovation through attention and threshold effects; and digitalisation is understood not as an automatic vector of formalisation, but as a process that can simultaneously sustain, transform, and hybridise both formal and informal economic arrangements. In doing so, the thesis invites entrepreneurship and innovation research to re-examine foundational assumptions about compliance, legitimacy, and market functioning in contexts where formal rules are contested and institutional uncertainty is routine (Webb et al., 2009; Morris & Polese, 2013; Salvi et al., 2023). The significance of these contributions cuts across multiple fields and rests on the premise that informality is a complex, historically embedded phenomenon that cannot be adequately explained within a single disciplinary lens; rather, it requires an explicitly interdisciplinary approach that bridges institutional analysis, organisational theory, and socio-cultural accounts of economic practice (Klein, 1990). For informal economy theory, the thesis adds social and cultural dimensions into analyses that often focus narrowly on tax evasion and exclusively quantitative studies (Medina and Schneider, 2021). It supports calls to treat informality as an embedded institutional phenomenon and provides rich empirical examples of how informal norms (trust networks, gift exchanges,

informal finance) sustain entrepreneurship. In development economics, the findings challenge orthodox models that view high informality as an inevitable growth drag. Instead, this research suggests that under the right conditions (effective digital infrastructure, targeted support) the informal sector can foster innovation-led resilience, underscoring its "structurally embedded" role in Central Asian economies. Finally, for institutional entrepreneurship, the thesis spotlights informal entrepreneurs as agents of institutional change. These actors creatively navigate institutional voids — blending Scott's metis with techne — and even influence policy. In doing so, the work contributes to understanding how grassroots firms co-create the rules of the game in transitional contexts.

1.10 Practical Implications

The thesis provides practical implications for (a) entrepreneurs/managers operating in semi-formal environments and (b) policymakers and development actors attempting to support innovation while improving compliance capacity. For entrepreneurs, especially micro-entrepreneurs and small firms exposed to sudden shocks or volatile demand, the evidence suggests that resilience and upgrading are most sustainable when digital adoption is translated into repeatable routines rather than improvised fixes. Concretely, this means establishing a basic but stable operating system: one primary acquisition channel (e.g., Instagram/TikTok for discovery), one order-management channel (e.g., WhatsApp/Telegram or other online platforms for confirmations), and one simple fulfilment workflow by setting up a simple, repeatable workflow in which a clear product catalogue feeds into a standardised order form or message template, customers are then guided toward a defined payment option, delivery or pick-up is scheduled within an agreed time window, and the interaction is closed with a brief after-sales follow-up message to confirm satisfaction and encourage repeat purchases. The key point is not "be on social media," but standardise the pipeline so that higher demand does not create chaos and disruption. Entrepreneurs can then diversify offerings in platform-compatible ways that reduce uncertainty: bundles, pre-orders, "ready-to-ship" items, subscriptions, or service packages that match delivery constraints and predictable procurement. This reflects what the thesis documents in practice: digital tools expand reach quickly, but without basic process discipline (pricing, inventory checks, order tracking), scale remains fragile and short-lived (Leonardi, 2020; Atiyas & Dutz, 2021). Furthermore, the crisis prompted many entrepreneurs to reconfigure their supply chains toward more local sourcing, reducing dependence on distant and disrupted routes. This shift lowered transport and shipping costs, increased reliability under uncertainty, and—by

strengthening linkages with domestic suppliers—supported local producers and contributed to broader economic resilience.

For SMEs competing against informal businesses, the thesis suggests shifting upgrading efforts toward advantages that are hard to copy through simple price undercutting and embedding them structurally. Instead of responding with reactive cost cutting, firms are more likely to sustain competitiveness by formalising a small set of operational upgrades. This involves turning day-to-day operations into a clear, repeatable system: first by explicitly mapping and documenting the main workflow—from procurement, to production or service delivery, to distribution, and finally to how returns and customer complaints are handled—so responsibilities and handovers are clear. It then requires monitoring a small set of practical indicators, such as lead times, stock turnover, return rates and defect rates, to spot delays and bottlenecks early and prevent recurring inefficiencies. Finally, it means strengthening the capabilities that consistently underpin innovation by investing in external training, learning from suppliers and customers, or engaging in sector networks for improvement (Ocasio, 1997; Hlioui et al., 2022). Therefore, upgrading the process of innovation here means turning repeated pain points (delays, waste, inconsistent quality) into explicit routines and metrics. This is how firms protect innovation efforts when informal competition intensifies and managerial attention is pulled toward short-term tackling and firefighting.

On the policy side, the thesis supports an approach that combines simplified compliance pathways with credible benefits of formality, rather than relying primarily on punitive enforcement. Evidence across post-socialist and emerging-market settings suggests that discretionary crackdowns can backfire by increasing fear and concealment, while predictable, simplified systems and visible returns to compliance can shift behaviour more sustainably (Williams & Nadin, 2014; Floridi et al., 2020; Williams, 2023). In practical terms, this assigns clear responsibilities: tax authorities should reduce compliance friction through simplified regimes, digital filing, and proportional risk-based inspections. Tax authorities, inspectors, and local administrative bodies should offer practical support that firms can access once they complete a few simple, low-burden formal steps. For example, small-scale financial incentives to fund upgrading activities, modest grants tailored to micro and small businesses, and discounted or publicly supported tools that make basic bookkeeping and record-keeping easier to adopt. In parallel, development partners can help finance “light-touch” digital onboarding packages that introduce entrepreneurs to everyday compliance-friendly routines, such as setting up electronic payment options, issuing simple invoices, and maintaining basic accounts, so that moving toward formality feels like a manageable progression rather than a sudden leap and overwhelming task, as expressed by a number of interviewed entrepreneurs. Where governments want gradual formalisation, incentives must be designed so

that the first steps are small, low-risk, and visibly useful (Benhassine et al., 2015; Williams, 2023).

Finally, applied support interventions can be designed and delivered by government bodies that work directly with SMEs (such as Kazakhstan's DAMU Entrepreneurship Development Fund), alongside chambers of commerce and local business associations, often in partnership with donor programmes, by offering short, practical training that builds (i) tax literacy, so entrepreneurs understand how simplified regimes operate, which incentives and benefits they are entitled to, which behaviours typically trigger inspections, and what documentation is considered acceptable by the tax authorities; (ii) financial literacy, so they can price and cost properly, manage cash flow, and separate household and business finances; and (iii) digital-operational literacy, so they can run day-to-day digital commerce effectively through structured order management, basic platform analytics, the integration of e-payments with simple record-keeping, and appropriate data protection practices. This educational focus follows from the thesis' institutional argument: where informal practices are reproduced through low institutional trust, uneven regulatory legitimacy, and high transaction costs, interventions are more likely to be effective when they reduce uncertainty and make formal procedures practically accessible, rather than when they treat informality simply as a matter of non-compliance to be corrected (Williams, 2023). In sum, the practical message is that innovation and gradual formalisation are most compatible when institutions provide credible, efficient pathways—and when entrepreneurs translate experimentation into routines that can survive beyond the crisis moment.

1.11 Limitations

This thesis has boundaries that shape how its findings should be interpreted. The analysis focuses on Kazakhstan and Kyrgyzstan, two former Soviet republics that became independent in 1991 and whose post-socialist trajectories were profoundly shaped by the neoliberal turn of the 1990s (Sanghera and Satybaldieva, 2021). Market liberalisation, privatisation, deregulation, and the retrenchment of state welfare reconfigured state–business relations and redistributed economic risk onto households, workers, and small entrepreneurs. In both countries, these transformations widened inequality, weakened social protection, and created conditions in which informal practices became not simply residual, but often necessary mechanisms of livelihood, exchange, and adjustment. At the same time, the state has generally framed informality in narrow fiscal and regulatory terms—as underreporting, non-registration, or non-compliance—rather than as a phenomenon also rooted in dispossession, uneven

institutional capacity, low trust, and the social consequences of market transition. As a result, official responses have often centred on registration drives, tax simplification, inspection regimes, and digital monitoring, even where everyday economic practices continue to rely on informal coordination because formal institutions are experienced as costly, selective, or insufficiently supportive. These post-Soviet and post-socialist specificities mean that the findings are most directly relevant to contexts where informality is historically embedded in neoliberal restructuring, hybrid governance, and uneven state legitimacy, rather than universally generalisable across all economies. Empirically, the work relied on cross-sectional survey and interview data, based on self-reported and perceptual measures of informality and innovation; entrepreneurs may understate informal practices or simplify innovation activities, and interviews conducted in local languages were translated into English, with a minor risk of nuance loss. These features mean the observed positive relationships between informality, informal competition and innovation should be treated as well-grounded patterns and hypotheses rather than definitive causal claims. Rather than undermining the results, these limitations clarify their scope and point to clear avenues for future research, including longitudinal designs, alternative measures and comparative studies in additional countries to test and extend the mechanisms identified here.

1.12 Future Research Avenues

Future research could extend this thesis in several directions. First, comparative designs should move beyond Kazakhstan and Kyrgyzstan to examine other transitional and emerging economies with different institutional legacies, enforcement capacities, and digital infrastructures. This would help establish which informality–innovation mechanisms observed here are context-bound and which travel across settings, and would enable sharper comparisons between post-Soviet environments and other regions of the Global South where informal “orders” may be organised through different norms, networks, and regulatory bargains. At the same time, informality is neither new nor confined to lower-income contexts. Further studies are also warranted in Western economies, where informal practices may take different forms (e.g., platform-mediated undeclared work, bogus self-employment, uncontracted work), yet can still generate substantial consequences for tax bases, labour protections, and competitive dynamics in product and service markets.

Secondly, longitudinal or experimental approaches would add causal clarity. Panel surveys and repeated qualitative engagements with the same firms would make it possible to track how informal practices, digital adoption and innovation evolve over time, especially through socio-economic shocks such as pandemics, political crises or regulatory reforms. Field experiments or policy pilots (for

example, targeted trust-building interventions, tax simplification, or digital training programmes) could help identify which policy levers actually change entrepreneurs' behaviour, rather than inferring this indirectly from cross-sectional associations.

Another avenue for future research concerns the limits created by studying informality through samples of registered firms. Both the direct-survey and BEEPS-based components of this thesis necessarily capture firms that are visible enough to enter business registers or formal survey frames, while more weakly registered, transient, or fully unregistered actors remain harder to observe. Future work could therefore combine enterprise surveys with targeted respondent-driven sampling, marketplace ethnography, digital trace analysis, or collaborations with local associations in order to better capture the parts of the informal economy that fall outside formal sampling frames. Relatedly, greater attention should be devoted to the relationship between micro-entrepreneurs and digital gig-platforms, where platform rules, commission structures, algorithmic visibility, and payment infrastructures may create new dependencies between small business actors and large transnational intermediaries.

Finally, more extensive and fine-grained qualitative studies are needed to unpack mechanisms that this thesis could only outline. Future research might, for instance, use digital trace data from platforms, mobile payments or social media to observe how quasi-formal infrastructures mediate informal trade; or ethnographic and network-analytic methods to examine how gender, age, migration status and social ties influence informal entrepreneurs' access to resources and their innovation strategies. Finally, there is scope for further conceptual and measurement work: developing indicators that capture informality as an institutional order (rather than only as under-reporting), and operationalising attention-based mechanisms in highly informal environments, would allow stronger tests of the theoretical arguments advanced in this thesis.

1.13 Conclusive Remark

Researching and writing about informality has been a demanding endeavour precisely because it concerns practices that are often deliberately kept out of sight and rarely discussed openly. Many entrepreneurs were understandably cautious about sharing details on day-to-day operations, record-keeping, and compliance, especially in environments where regulations may be enforced selectively and where disclosure can be perceived as risky. This reluctance is not simply an individual preference for secrecy; it is shaped by the broader political and moral framing of informality. Years of condemnation-oriented campaigns and public discourse that cast informal activity primarily as deviance or

wrongdoing have often discouraged more constructive engagement with the structural drivers of informality—administrative burdens, weak services, low institutional trust, and uneven enforcement—thereby keeping a substantial part of economic life "off the radar" and harder to understand empirically.

One purpose of this thesis is to hopefully contribute to a more mature debate, one that takes informality seriously as an empirical reality and addresses it without moral assumptions. Progress requires moving beyond preconceptions and recognising that the issue cannot be "solved" by entrepreneurs alone: consumers, employers and employees, business associations, tax authorities, and policymakers all shape the incentives and norms that sustain semi-compliance. In that sense, informality is not best approached as a list of deficits—missing compliance, missing capacity, missing trust. A central takeaway of this thesis is that informality is better understood as a historically produced and socially embedded mode of coordination than as a lack of regulation or order. In Kazakhstan and Kyrgyzstan, informal practices are intertwined with how economic actors navigate institutional ambiguity, selective enforcement, and unequal access to formal protections, making them constitutive of market life rather than external to it. Acknowledging this does not romanticise informality, but it makes it analytically intelligible, a phenomenon with routines, justifications, and internal logics through which entrepreneurs translate institutional constraints into everyday decisions.

A second takeaway concerns innovation and the often-misunderstood creative capacity of highly informal environments. In Kazakhstan and Kyrgyzstan, where small businesses and micro-entrepreneurs constitute the backbone of everyday economic life, innovation rarely appears as formal R&D; it is more commonly expressed through practical, incremental improvements that allow firms to keep operating under uncertainty. Entrepreneurs adjust suppliers, redesign service delivery, experiment with pricing and product bundles, and develop new ways of building customer trust, often with minimal resources and little institutional support. What this thesis makes visible is that informality does not simply constrain upgrading; in many cases it also pressures and enables small entrepreneurs to find workable solutions quickly. In the contexts examined here, innovation is best conceptualised not as a discrete breakthrough, but as a situated process of reorganisation through which businesses adjust products, processes, supply arrangements, and customer interfaces under conditions of uncertainty. These adjustments may rely on formal routines, informal practices, or, more typically, hybrid combinations of both.

If there is a practical lesson I take from this work, it is the resilience of entrepreneurs and the fact that this resilience is not a side note but a central reason these economies continue to function under institutional strain and economic shocks and crisis. A proportional approach is therefore essential:

expectations and enforcement need to match firms' actual means, and pathways toward compliance need to be realistic, staged, and supportive rather than punitive. Preserving and incentivising entrepreneurial initiative through low-burden rules, credible benefits of formalisation, and practical support for upgrading, matters not only for fairness, but because it protects the very adaptive capacity that keeps markets running and sustains livelihoods in Kazakhstan and Kyrgyzstan.

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Acknowledgements

First and foremost, I would like to express my deepest gratitude to Professor Susanne Durst. Without her tireless and unwavering support, patience, and perseverance, this PhD would simply not have been completed. I am profoundly thankful for her guidance and for believing in this project even at moments when I struggled to believe in it myself.

I am also sincerely grateful to Professor Rodica Ianole-Calin for her support and collaboration, which were equally important in bringing this work to completion. My sincere thanks also go to Abel Polese, Principal Investigator and supervisor, for making this project possible in the first place and for consistently encouraging me to reach the completion of my doctoral studies.

A special thank you goes to my fellow researchers in the MARKETS Innovative Training Network. You have been extraordinary companions during this chapter of our lives: inspiring, supportive, and always ready to listen. Sharing this journey with you made every challenge more bearable and every achievement more meaningful. I will always be proud of what we experienced and accomplished together.

I would also like to thank all the professors, researchers, and practitioners I have met throughout my academic journey. Our conversations and discussions have been a constant source of inspiration and have encouraged me to develop my thinking and writing always with a critical perspective. It has been an honour to share both academic and personal exchanges with you, and I remain deeply grateful for the teachings and reflections that have shaped me in such meaningful ways.

To my mother, father, and sister, I owe more than words can express. Thank you for standing by me throughout this long and demanding journey, for encouraging my academic path, and for giving me the freedom to pursue the opportunities that have enriched my life. I am also deeply grateful to Margaretha, Maÿlis, and Maria Paola, who have seen me at my lowest on certain days, listened patiently to my complaints, and still managed to offer kindness, perspective, and encouragement. Your presence has meant more to me than you know.

My thanks also go to the librarians and university staff, whose work created the conditions that allowed me to study, think, and write. Finally, I would like to acknowledge the artists whose music and art accompanied me throughout these five years. Their work helped me stay afloat, find motivation, and lift my spirits during the most difficult moments.

To all of you, thank you from the bottom of my heart.

Abstract

Navigating and Leveraging Informality amid Uncertainty: Entrepreneurial Adaptation and Strategies in Post-Soviet Kazakhstan and Kyrgyzstan

This doctoral thesis examines how entrepreneurs in Kazakhstan and Kyrgyzstan navigate and leverage informality to innovate and adapt under institutional uncertainty. It argues that informality is not adequately captured as hidden or residual economic activity alone, but should be understood as a broader institutional and relational order shaped by state regulation, selective enforcement, social norms, and everyday business practices. The thesis therefore distinguishes between the shadow economy as a measurable monetary outcome and informality as the wider set of practices and relations that sustain it.

The study adopts a mixed-methods, multi-level design grounded in critical realism and pragmatism. It combines: (1) a direct manager survey in Kyrgyzstan to estimate the shadow economy and reassess binary formal–informal categories; (2) an econometric analysis of 1,094 Kazakh SMEs using BEEPS data to examine how informal competition affects innovation; and (3) qualitative interviews with 12 micro-entrepreneurs in Kazakhstan to explore digital adaptation in crisis conditions.

The findings show that semi-formality is widespread, informal competition can stimulate innovation up to a threshold, and digital transformation tends to reconfigure rather than eliminate informality. Overall, the thesis shows that informality is a constitutive part of economic life in post-Soviet Kazakhstan and Kyrgyzstan and that its relationship with innovation is contingent, cross-level, and context-dependent.

Lühikokkuvõte

Mitteametlikkus ebakindluse keskel: ettevtlusalane kohanemine ja strateegiad postsovetlikus Kasahstanis ja Kõrgõzstanis

Käesolev doktoritöö uurib, kuidas ettevõtjad Kasahstanis ja Kõrgõzstanis mitteametlikkuse tingimustes tegutsevad ning seda innovatsiooni ja kohanemise eesmärgil institutsionaalse ebakindluse olukorras kasutavad. Töös väidetakse, et mitteametlikkust ei saa käsitada üksnes varjatud või jääkmajandustegevusena, vaid seda tuleb mõista laiema institutsionaalse ja suhete kaudu kujuneva korrastusena, mida vormivad riiklik regulatsioon, valikuline jõustamine, sotsiaalsed normid ja igapäevased ettevõtluspraktikad. Seetõttu eristab väitekiri varimajandust kui mõõdetavat rahalist väljendust ning mitteametlikkust kui laiemat praktikate ja suhete kogumit, mis seda alal hoiavad.

Uurimus tugineb mitmemeetodilisele ja mitmetasandilisele uurimiskavale, mille filosoofiliseks aluseks on kriitiline realism ja pragmatism. Töös ühendatakse: (1) Kõrgõzstanis läbi viidud ettevõtete juhtide küsitlus, mille eesmärk on hinnata varimajanduse ulatust ja mõtestada ümber formaalse–mitteformaalse binaarsus; (2) 1094 Kasahstani väikese ja keskmise suurusega ettevõtte andmetel põhinev ökonomeetriline analüüs, et uurida, kuidas mitteametlik konkurents mõjutab innovatsiooni; ning (3) 12 Kasahstani mikroettevõtjaga tehtud kvalitatiivsed intervjuud, et analüüsida digitaalset kohanemist kriisiolukorras.

Tulemused näitavad, et poolformaalne tegutsemine on laialt levinud, mitteametlik konkurents võib teatud piirini innovatsiooni soodustada ning digitaliseerumine pigem kujundab mitteametlikkust ümber kui kaotab selle. Kokkuvõttes osutab väitekiri, et mitteametlikkus on postsovetlikus Kesk-Aasias turuelu lahutamatu osa ning selle seos innovatsiooniga on tingimuslik, mitmetasandiline ja kontekstitundlik.

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Publications

- Aguzzi, T. (2025), "Un vertice storico a Samarcanda", Istituto per gli Studi di Politica Internazionale (ISPI). Available at: https://www.ispionline.it/it/pubblicazione/un-vertice-storico-a-samarcanda-206171

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