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Do Emerging VC Markets Mirror Established Ones? A Comparison of CEE, the USA and Israel

Abstract

The venture capital market in Central and Eastern European (CEE) countries—particularly Poland, Hungary, and the Czech Republic—has experienced rapid growth in recent years, prompting a closer examination of the factors driving this expansion and the long-term trajectories of these emerging ecosystems. This study aims to compare their development stages with those of the USA and Israel, highlighting key similarities and differences in investment patterns, government interventions, and market maturity. By identifying the current phases across these CEE markets and projecting potential future stages, the research seeks to contribute to a deeper understanding of venture capital (VC) dynamics in transition economies. Using a multiple case study methodology, the analysis examines the evolutionary phases of VC markets in the USA, Israel, and the three CEE countries—Poland in more depth. The findings reveal that Poland and Hungary share parallels with the USA and Israel—particularly with Israel, where government programs have spurred growth—while the Czech Republic has relied more on private-sector initiatives. The analysis concludes that Poland and Hungary remain in the emergence phase of VC development, with further phases likely to follow. This research contributes to the literature on VC evolution by offering insights into the comparative growth trajectories of emerging ecosystems and providing a perspective on the opportunities and challenges that may lie ahead for these countries.

Keywords

venture capital | evolutionary phases | market comparison | emerging markets | Poland

JEL Codes

G24, O38, O57

1. Introduction

Venture capital (VC) plays an increasingly critical role in driving emerging markets' technological and economic development. VC investments can spur both short- and long-term economic growth (Pradhan et al., 2019), and can have a significant impact on GDP compared to other forms of capital (Zhang et al., 2013). Israel's well-established VC industry illustrates this effect: venture funding has significantly influenced GDP more than traditional capital has. In addition, VC contributes to regional development through a surge in

innovation, the attraction of highly skilled talent, and overall ecosystem expansion (Samila, 2012).

Many governments, recognising the benefits of a robust VC environment, have introduced various programmes to spur growth in this sector. Although such efforts differ in structure, funding mechanisms, and legal frameworks, they often converge on similar strategies. Avnimelech et al. (2004), for instance, compare the evolution of VC markets in the United States and Israel, demonstrating how apparently dissimilar markets can undergo parallel developmental phases.

In recent years, the VC sector in Poland has drawn considerable attention, with 2021 and 2022 investment levels surpassing EUR 750 million (PFR Ventures, 2024). Similarly, Hungary and the Czech Republic have made notable strides, supported by a blend of domestic initiatives, EU structural funds, and private investor interest. Yet, the role of public-private collaborations and the specific ways these markets emulate or depart from the established USA and Israeli ecosystems are not fully understood.

This study seeks to fill that gap by analysing the evolutionary phases of VC development in the USA, Israel, and three CEE countries—Poland, Hungary, and the Czech Republic—to gauge the extent to which these emerging markets mirror more mature ones. Drawing on the framework proposed by Avnimelech et al. (2004), which identifies five key phases of VC market growth, the paper explores the interplay between public policy, foreign investment, and local entrepreneurial capabilities in shaping VC expansion. In doing so, it aims to clarify the current state of each CEE market, provide insights into potential future consolidation, and offer lessons for policymakers seeking to foster sustainable growth in the venture capital sector.

The rest of the article proceeds as follows: The literature review, which presents an in-depth look at the linkages between the development of the VC markets in the US and Israel to provide a reference point for subsequent studies, then the current literature on the Polish venture capital market is presented. Next, the methodology section describes the research method and data sources used. The results section then shows the comparative analysis findings with a graphical representation of the results obtained in the quantitative part and their reasoning. The last part of the article contains sections on discussion and conclusions.

2. Literature Review

2.1. VC market evolutionary phases based on the USA and Israel

When reviewing the comparative development of venture capital (VC) industries in the United States and Israel, the seminal study by Avnimelech et al. (2004) offers a framework of five distinct phases for understanding the evolution of VC markets. The first

phase labelled “background conditions”, primarily involves establishing early high-technology sectors through increased R&D investment. As innovations proliferate and the funding needs of emerging ventures grow, the market transitions into a “pre-emergence” phase, marked by the rise of informal VC sources and, over time, the creation of formal VC funds. During this phase, extensive experimentation with financing methods contributes to crucial insights about effective funding practices.

The “emergence” phase begins with robust VC and startup growth, accompanied by increasing competition among funds and an influx of new managers and entrepreneurs. Following this expansion, the market may enter a crisis phase, triggered by adverse economic conditions or unfavourable government policies. This phase typically results in eroded investor confidence, significant fund exits, and widespread startup failures. The final phase is “consolidation”, which generally includes restructuring the VC landscape, establishing new institutional frameworks, and introducing policy reforms informed by lessons learned in previous phases (Avnimelech et al., 2004).

2.1.1. Background Conditions Phase

The initial phase of venture capital (VC) development in the United States and Israel – commonly referred to as the background conditions phase – reflects how economic and security crises can catalyse a market’s emergence (Avnimelech et al., 2004). In the U.S., the decline of New England’s garment industry and the Great Depression highlighted the need for new funding mechanisms to support smaller ventures (Hsu & Kenney, 2005). Additionally, post-World War II and Cold War imperatives increased demand for advanced technologies, especially in military applications, bringing renewed attention to underutilized scientific potential.

By contrast, Israel’s Six-Day War and subsequent arms embargo accelerated the development of local R&D capacity in the defence sector, laying the foundation for future technological innovation and eventual VC growth (Vekstein, 1999). Government and institutional involvement, though uneven across the two countries, proved decisive in shaping early market structures. In the U.S., military-led R&D

helped smaller tech firms and universities thrive, indirectly fostering a nascent VC ecosystem. In Israel, the government's Office of the Chief Scientist offered direct support for R&D, while foreign investment from multinational corporations brought essential financial resources and managerial expertise (Avnimelech et al., 2004). These parallel yet distinct efforts underscored the key role of government and institutional engagement in establishing initial market conditions for VC.

2.1.2. Pre-Emergence Phase

The transition from basic R&D ecosystems to organized venture capital (VC) structures in both the United States and Israel can be traced to the pre-emergence phase, which bridges nascent technology innovation and formalized VC financing. In the United States, this phase gained momentum following World War II, when state-directed military spending stimulated interest in high-tech ventures that required external funding. One pivotal development was the establishment of the American Research and Development Corporation (ARD), which channelled capital from institutional and private sources into emerging technology firms. Concurrently, foundations such as Venrock—backed by the Rockefeller family—provided additional capital and governance expertise, reinforcing the foundational VC community (Adams 2005). Although largely private-sector driven, government initiatives—often indirect—created favourable conditions for entrepreneurial activity, particularly in aerospace and computing (Hsu & Kenney, 2005).

Israel's pre-emergence phase, by contrast, was fuelled by a confluence of policy interventions and demographic shifts. In the late 1980s and early 1990s, substantial immigration from the former Soviet Union brought highly educated engineers and scientists. This demographic wave dovetailed with government-led programs such as the Magnet Program, Technology Incubators, and Inbal, which served multiple functions: they provided capital and managerial guidance, encouraged academic-industry collaboration, and facilitated the commercialization of early-stage technologies. Although some initiatives were more successful than others—Inbal, for instance, encountered challenges in raising private capital—the collective outcome was a marked expansion of the

local high-tech start-up ecosystem (Avnimelech, 2009; Frenkel et al., 2005; Vekstein, 1999).

Despite dissimilar historical timelines, the United States and Israel demonstrated parallel trajectories during the pre-emergence phase. Both countries nurtured a culture of innovation—through public or quasi-public channels—that lowered barriers to market entry for new ventures. They also concentrated resources on strategic technology sectors, albeit for different national priorities: the United States emphasised its Cold War posture, while Israel focused on bolstering domestic research capacity. By the end of this phase in each market, formal VC organisations—along with a pool of skilled entrepreneurs and fund managers—were better positioned to embark on the next phase of rapid growth (Avnimelech et al., 2004).

2.1.3. Emergence Phase

During the emergence phase, the venture capital (VC) industries in the United States and Israel underwent transformational changes that solidified their positions as innovation hubs. In the United States, this period saw the formation of key institutions, including Draper, Gaither and Anderson (DGA)—the first VC firm to operate under a limited partnership model. This legal structure soon became the standard for subsequent VC organizations, fostering clarity in fund management and risk-sharing (Avnimelech et al., 2004). The launch of NASDAQ and the successful IPOs of high-tech pioneers like Intel reinforced investor confidence by providing liquidity and highlighting the growth potential of young tech firms.

An equally significant development was the Small Business Investment Company (SBIC) programme, introduced in 1958 under the auspices of the Small Business Administration (SBA). As detailed in House Report 104-873 (1996), SBIC was a public-private partnership co-investing in VC funds that targeted early-stage companies, addressing the equity gap for new entrepreneurs. Several household-name firms—including Apple, Tesla, Intel, and FedEx—received early support from SBIC funds (SBA, 2017). While the USA emphasised market-driven growth aided by public financial instruments, it was the creation of reliable institutions—from NASDAQ to SBIC—that helped transform sporadic investments into a thriving VC ecosystem.

In Israel, the emergence phase hinged on bold policy experiments, particularly the Yozma programme. Building on earlier lessons from Inbal—whose risk-reduction model encountered hurdles in attracting private investors—Yozma injected USD 100 million into a domestic VC industry that, until then, had been largely informal (Avnimelech & Teubal, 2004). A cornerstone of Yozma's strategy was its partnership model, requiring foreign and domestic institutions to collaborate as limited partners in newly formed VC funds. The programme also allowed private investors to buy out the government's share at cost, providing potent incentives for active, risk-taking management (Wonglimpiyarat 2015).

Between 1990 and 2000, Israeli VC investments soared from USD 5 million to USD 3.3 billion, with affiliated funds eventually managing more than USD 5.5 billion (Avnimelech et al., 2004). The Yozma initiative did more than pump capital into the market; it created a culture of innovation and collaborative learning that propelled Israel onto the global stage as the "Start-Up Nation." This contrasts with the U.S. case, where private-sector institutions played a more organic role. Still, both trajectories emphasise how government intervention—whether direct or indirect—can catalyse a dormant VC market.

2.1.4. Crisis Phase

The crisis phase represents a pivotal juncture in venture capital (VC) evolution, as market shocks trigger a collective loss of confidence and a flight of capital away from early-stage investing (Avnimelech et al., 2004). In the United States, the 1970s brought significant turmoil; stock market declines and growing uncertainty surrounding the Vietnam War tightened liquidity, diminishing the appetite for new ventures. Moreover, pension fund managers were constrained by the Employee Retirement Income Security Act (ERISA), which imposed strict fiduciary rules on pension investments (Morgan, 2015). This regulatory bottleneck reduced potential capital inflows and curbed the establishment of new VC funds (Gompers & Lerner, 1999).

In Israel, the crisis manifested in the early 2000s amid the global dot-com collapse, which dealt a heavy blow to high-tech valuations. Although Israeli VC funds had limited exposure to dot-com startups specifically, the ensuing downturn in technology stocks led to larger capital constraints across the

entire ecosystem (Avnimelech et al., 2004). As exit opportunities dried up and risk capital dwindled, many new funds either shut down or merged, while start-ups faced an acute capital shortfall (Avnimelech & Teubal, 2006). This confluence of global and local factors highlights how rapidly VC markets can shift from exuberant growth to severe contraction.

Despite the different catalysts—regulatory friction in the U.S. versus global tech headwinds in Israel—both crisis scenarios demonstrate a consistent pattern: weakened investor sentiment, reduced fundraising, and widespread market consolidation. However, these challenges frequently lay the groundwork for institutional reforms and policy recalibrations, which pave the way for a more resilient VC ecosystem in the subsequent consolidation phase.

2.1.5. Consolidation Phase

The consolidation phase in the United States and Israel represents a critical maturation of their venture capital (VC) industries, characterised by stable capital flows, geographic clustering, and the institutional restructuring necessary for long-term resilience (Avnimelech et al., 2004). In the U.S., this phase unfolded in the late 1970s and early 1980s, when the successful IPOs of Genentech and Apple in 1980 signalled a shift away from government-dominated contracts toward dynamic civilian markets (Gompers, 1994; Avnimelech et al., 2004). Consequently, venture capital became a cornerstone of the national innovation ecosystem, with Silicon Valley emerging as a geographic hub attracting nearly 40% of overall VC investment (Florida, 2016).

In Israel, the consolidation phase began in 2004, following the market upheavals of the early 2000s (Avnimelech & Teubal, 2006). After rebounding from crisis-related capital shortages, the Israeli VC market exceeded its pre-downturn fundraising levels and experienced a surge in both startup activity and exits, including IPOs and strategic acquisitions by multinational firms. Alongside these quantitative gains, qualitative shifts emerged, including the proliferation of non-VC agents—such as private equity firms—and the formation of new strategic alliances (Avnimelech & Teubal, 2006).

In both countries, legislative reforms and institutional innovations were integral to consolidation, ensuring that the post-crisis landscape

remained robust and better positioned to handle future market shocks (Avnimelech et al., 2004). By deepening ties between government policies, research institutions, and private investment, each ecosystem laid the groundwork for sustained global competitiveness in high-tech sectors.

2.2. Selected CEE Countries – Poland, Hungary and the Czech Republic

Research on venture capital (VC) in Central and Eastern Europe (CEE) has frequently spotlighted Poland as a prominent emerging market, yet scholarship also points to noteworthy developments in Hungary and the Czech Republic (Karsai, 2012; Klonowski, 2006; Molnár, 2021). In the Polish context, early work by Klonowski (2005) divided the market into three phases—Development, Expansion, and Correction—based on fundraising patterns, investment volume, and exit mechanisms over the 1990–2003 period. Krawczyk (2008) extended this historical lens by examining the transition from aid-based funds to the first commercial funds, highlighting how Poland's transformation after the communist era influenced early-stage financing. Zasepa (2015) underscored the potential of public capital in bridging equity gaps, analysing programs such as the National Capital Fund (KFK) to illustrate how public–private co-investment could spur innovation. More recently, Grzywacz and Jagodzińska-Komar (2023) note that while Poland's VC market has grown significantly between 2019 and 2023, its capacity to rival more mature Western markets remains constrained by the limited participation of private investors.

Turning to Hungary, Molnár (2021) documents the gradual emergence of VC after the communist regime's collapse in 1989, initially dominated by privatisation-focused investment funds. By the early 2000s, venture financing shifted toward technology-oriented start-ups, propelled by EU programs (e.g., JEREMIE) and government-backed funds like Széchenyi Capital Fund Management (SZTA) and Hiventures. Karsai (2012) observes that Hungary's VC sector remains heavily dependent on public co-financing, which, although it has stimulated the market, also raises questions about long-term sustainability once subsidised funding recedes.

In the Czech Republic, the VC market has followed a distinct path. Despite the establishment of a Czech Venture Capital Association in 1991,

Klonowski (2006) notes that membership dwindled due to unfavourable investment conditions and the fallout from voucher privatisation, which introduced cross-ownership complexities (Romaine, 2003, as cited in Klonowski, 2006). While Czech start-ups have increasingly drawn private capital—particularly at seed and growth stages—policy-based initiatives comparable to those in Poland or Hungary have been less successful. Consequently, the Czech market has relied more on private-sector impetus; even so, recent data (Ptacek et al., 2015) indicate an upswing in VC investment volumes in high-tech and innovation-driven fields, suggesting an evolving ecosystem that does not necessarily hinge on large-scale government programmes. Overall, the literature on Poland, Hungary, and the Czech Republic illustrates both commonalities—such as the influence of EU funding and the legacies of economic transition—and divergences related to policy intensity and private sector engagement. Despite growing research activity, notable gaps remain. Longitudinal studies that trace VC market development in CEE countries over extended horizons—particularly in relation to established benchmarks in the USA and Israel—are still relatively scarce. This gap highlights the need for comparative analyses that uncover how public interventions, foreign investments, and local institutional factors converge or diverge across different CEE ecosystems.

It becomes evident that various periods, especially the early stages of VC market development, are extensively covered. Additionally, the literature includes descriptions of programmes implemented in Poland. However, there is a noticeable gap in the current literature regarding the development of the venture capital market, particularly when compared to the development of other markets.

3. Methodology

The primary objective of this study is to determine whether the stages of venture capital (VC) market development in Central and Eastern Europe (CEE) exhibit patterns like those documented for the United States and Israel. To accomplish this, the research follows the multiple case study framework proposed by Yin (1994). Rather than examining all markets in parallel, the study focuses mainly on Poland as a core comparison to the USA and Israel, while incorporating additional insights from other CEE countries.

To contextualise the analysis, the study extensively draws on Avnimelech et al. (2004), whose work on VC market evolution serves as both a conceptual anchor and a reference point. Scientific publications on emerging VC markets in Poland, Hungary, and the Czech Republic provide further detail, allowing the investigation to pinpoint specific development phases and compare them across all selected nations. Building on Avnimelech et al. (2004), the research also places special emphasis on governmental interventions—ranging from direct funding initiatives to legislative frameworks—to understand how such policies shape VC trajectories in emerging economies.

In addition, the study integrates quantitative data on capital sources, annual investment volumes, and VC investments per capita to complement the qualitative insights. These metrics were compiled from Dealroom, PFR Ventures, Invest Europe, and the National Bank of Poland (for currency conversions). Population data from the World Bank further facilitated the calculation of per capita VC investment, allowing a standardised comparison of market size and growth.

Based on existing work in this field and the research questions posed, the following six criteria guide the comparative analysis:

1. Initial Market Phenomena – Key historical or economic events that shape the early stages of each VC market.
2. Government Support – Common forms of public financing or institutional support.
3. Programme Structure and Impact – The design, implementation, and outcomes of government-led initiatives.
4. Legislative Changes – Legal and regulatory reforms influencing the evolution of VC.
5. Foreign Capital – The role of international funds and cross-border investments.
6. VC Investment Per Capita Over Time – Trends in per-person capital deployment as a sign of market maturity.

These criteria are applied selectively, reflecting the relevance of each factor at different development stages across the markets in question. Consequently, the comparative approach synthesises historical context, quantitative indicators, and institutional factors to evaluate whether—and how—CEE countries converge with the established models in the USA and Israel.

4. Results

4.1. CEE VC market development phases

4.1.1. Background conditions phase

Examining the classifications applied by Avnimelech et al. (2004) to the background conditions phase in the USA and Israel, it is evident that this phase in both countries was characterised by critical phenomena. These phenomena compelled the state to undertake R&D activities, leading to a large inflow of capital into young, innovative enterprises. By contrast, in Poland, the VC sector's initial development was not driven by military-industrial needs, as in the USA and Israel, but rather by the collapse of the communist system and subsequent systemic transformation and privatisation of enterprises, which triggered an inflow of capital. As Krawczyk (2008) notes, VC capital was perceived as a structural instrument to enhance the Polish economy's competitiveness and subsidise the underdeveloped technology/IT sector, which lagged due to decades of centralised economic planning. Across all analysed countries, a common feature is the focus on investments in IT and high-tech sectors. Thus, the background conditions phase in Poland is best traced to the start of systemic transformation in 1989, following the collapse of communism. Consistent with Israel's experience, the first funds in Poland (e.g., Polish-American Enterprise Fund, Social and Economic Investment Company, and Caresbac) emerged at the inception of the VC market. Notably, these early funds relied on foreign (primarily American) capital and operated with an aid-oriented mandate, a parallel to Israel's trajectory (Krawczyk, 2008).

A comparable development path is evident in Hungary. Molnár (2021) observes that in the immediate post-communist era (post-1989), global investment funds prioritised privatisation-related investments. For instance, the Hungarian-American Enterprise Fund, akin to Poland's early entrants, was among the first foreign funds. By the mid-1990s, regional funds became increasingly active, shifting focus to domestic company development. Molnár (2021) highlights the emergence of "classic venture capital" in Hungary by the late 1990s and early 2000s, marked by pioneering investments in private technology and media firms.

In contrast, Klonowski (2006) describes the early development of the Czech venture capital market as relatively underdeveloped compared to that of its

regional peers. Despite establishing the Czech Venture Capital Association in 1991, membership declined as financial institutions withdrew due to challenging investment conditions and participation in competing regional associations. A key factor in this sluggish growth was the shortcomings of the 1990s voucher privatisation program, which failed to inject new human capital into privatized enterprises and enforce budgetary discipline, resulting in cross-ownership complexities and ineffective corporate governance (Romaine, 2003, cited in Klonowski, 2006). Moreover, Czech entrepreneurial firms faced persistent barriers in credit and equity markets, constraining VC sector growth (Klonowski, 2006). Nonetheless, VC investment surged in the late 1990s, peaking in 2000, driven by pension funds and financial institutions, with capital sources shifting from non-European to domestic investors by the early 2000s (Klonowski, 2006).

Comparative analysis reveals that while background conditions varied across countries, they were universally present. Notably, divergent operational and structural frameworks for VC funds distinguish the cases: the USA lacked formal VC funds during this phase, whereas Israel saw nascent formal VC funds. In Central and Eastern Europe (CEE), funds emerged rapidly post-1989, capitalising on market potential. For example, Poland's earliest funds were aid-oriented, with private investment funds emerging only by 1994 (Krawczyk, 2008). However, Krawczyk's (2008) classification of Polish VC funds reveals heterogeneity: many operated within the broader private equity sector, targeting mid-cap firms rather than startups. Similar patterns are evident in Hungary and the Czech Republic. As Klonowski (2005) emphasises, while these funds were not explicitly VC-oriented, their investments indirectly stimulated sectoral growth.

Thus, unlike the USA and Israel, where formal VC funds definitively marked the end of the background conditions phase, CEE countries present a nuanced case. Initial foreign aid-based funds and subsequent private equity-oriented funds complicate the phase's endpoint. Consequently, the emergence of formal VC funds cannot serve as the sole indicator for concluding this phase in CEE contexts.

4.1.2. Pre-Emergence Phase

Looking at the significant developments during this phase in Israel and the USA, Avnimelech et al. (2004)

highlight the importance of strategic investments in technology sectors, human capital, and government support. In the USA, many key solutions – such as founding the first professional VC funds – appeared early and then spread elsewhere, while Israel's governmental efforts offer a closer parallel to some CEE countries.

In Poland, EU accession in 2004 gave access to structural funds aimed at bolstering young enterprises (Sabal et al., 2018). These resources, supervised chiefly by the Polish Agency for Enterprise Development (PARP) or by the Polish Development Bank (BGK) through programs like JEREMIE (Murray et al., 2012), coincided with broader public interventions for VC. Mirroring Israel's early initiatives (Technology Incubator, Magnet, Inbal), Poland introduced organisations such as PARP, the National Capital Fund (KFK), and the National Centre for Research and Development (NCBR). Despite limited success – Inbal in Israel (Avnimelech, 2009) and KFK in Poland (Bielicki, 2020) – both efforts taught policymakers the value of a fund-of-funds (FOF) model and the need for strong investment teams (Bielicki, 2020).

Hungary's development also accelerated after joining the EU in 2004, with VC investment rising severalfold thanks to JEREMIE funds (Karsai, 2012). These public-private partnerships focused on startups, echoing Israel's Yozma in their incentive mechanisms. SZTA (Széchenyi Capital Fund Management), established in 2011, operated under a FOF structure and accounted for more than half of VC investments in 2014–2015 (Molnár, 2021). Such programs, like those in Poland and Israel, addressed capital gaps caused by an underdeveloped private VC ecosystem.

In the Czech Republic, the pre-emergence phase is less clear. Despite EU membership in 2004, almost no structural funds were allocated to VC. From 2007 to 2013, just one seed-stage and 11 startup-stage transactions were noted (Ptacek et al., 2015), while the legislative and tax climate remained unfriendly to VC (Rajchlová et al., 2011). Two attempts at creating a public VC fund—one in 1995 and another in 2005—were abandoned or dissolved, and a subsequent Seed Fund launched under the OP Enterprise and Innovation program halted in 2014 (Rajchlová & Svatošová, 2016). Although CzechInvest was active, Dealroom data show it had a broad remit beyond VC, leaving insufficient information to gauge its market impact fully.

4.1.3. Emergence Phase

The emergence phase, as described by Avnimelech et al. (2004), is characterised by high VC growth and increased start-up activity, along with greater market competitiveness and improved availability of capital. In the case of the United States, the most important developments included the establishment of the NASDAQ, the first VC organisations structured as LPs, and government support through the SBIC program. In Israel, key milestones were the emergence of IPO opportunities for Israeli start-ups on the NASDAQ and, most importantly, the launch of the Yozma program in 1993. The Yozma program had a profound impact on the venture capital market in Israel. From 1990 to 2000, investments grew from USD 5 million to USD 3.3 billion. Its success went beyond initial support, as subsequent funds managed by VC firms affiliated with Yozma held a total capital of more than USD 5.5 billion, accounting for more than half of the investment in the sector. Moreover, the strategic approach of the Yozma program fostered a culture of innovation and collaboration, driving a collective evolution of the VC and startup market and a competitive advantage in the global marketplace (Avnimelech et al., 2004).

Once again, parallels can be observed between Poland and Israel in particular. Matching the events in Poland with the classification by Avnimelech et al. (2004), the start of Poland's emergence phase can be traced to the creation of the Polish Development Fund (PFR), which, through its subsidiary PFR Ventures, began operating in the VC sector in 2017. Initially, five programmes were launched under PFR Ventures: Starter, Biznest, KOFFI, Open Innovation, and PFR-NCBR CVC. These programmes differed in their objectives, investment principles, and forms of cooperation with private investors. PFR Ventures derives its funds from programs implemented by the European Union (with Bank Gospodarstwa Krajowego serving as the depository). Other sources include the Swiss Contribution program and capital from the Polish Development Fund. Notably, most of the initial funding for these programmes originated in the Smart Growth Operational Program (POIR) run by the European Union.

Below, a comparison will be made between the programs used in this phase by Poland and Israel, although the SBIC program in the United States will not be analysed. As Avnimelech et al. (2004) note, while many investments were made under SBIC, its

overall impact on the development of the VC market was less substantial than that of Yozma.

As the first edition of the POIR program has ended, it provides an interesting case study for comparison. Although its total impact cannot be fully evaluated for several more years because of the investment horizon, preliminary data suggest that this type of public-private partnership was necessary in Poland, as shown in Figure 1, which depicts the amount of invested capital over time.

Examining the invested capital in Poland over the past 15 years, we see that it remained very low until the launch of PFR Ventures. During the first full year of PFR Ventures' operation, the total invested capital surpassed the cumulative amount of the previous decade. Notably, some transactions executed during PFR Ventures' operation, which contribute to the total annual value, are single mega-rounds (transactions exceeding 10% of the value of all investments in a given year), highlighted in a different colour on the figure. However, even excluding these mega-rounds, the amount of invested capital in Poland's VC sector increased significantly.

Furthermore, data on the number of active VC funds in Poland reveal substantial growth since PFR Ventures was launched in 2017. For comparison, according to Statista (2024), 43 active VC funds operated in 2016, before PFR Ventures' establishment. By 2022, the number of active funds had exceeded 240. This more than 560% increase in active funds over six years demonstrates the dynamic development of the VC sector in Poland during its emergence phase. Interestingly, a parallel with Israel emerges here as well. As Avnimelech & Teubal (2004) reported, the number of VC funds in Israel rose from 2 in 1991 to over 100 in the 2000s.

The growing success of the first five PFR Ventures programmes is evidenced by the launch of a new edition of the PFR Starter, Biznest, Open Innovations, KOFFI, and CVC programmes at the beginning of 2024, supported by the European Funds for a Modern Economy (FENG). PFR Starter and PFR Biznest will facilitate investments through VC funds in small and medium-sized companies at the early stages of development. Notably, in this edition of PFR Starter, investors can benefit from a new profit-sharing asymmetry feature, allowing independent private investors a 2.5x profit multiplier relative to their share in the fund's capitalisation. The objective of PFR Biznest is to activate private investors (business

Table 1. Comparison of PFR Ventures (Poland) and Yozma (Israel) programs

	PFR Ventures (Poland) First edition POIR*	YOZMA (Israel)
Objective	Support the development of the local Venture Capital and Private Equity market and the innovation ecosystem.	Creation of a competitive domestic VC industry.
Investment Structure	The organisation operates in a fund of funds (FOF) format. Each sub-fund has a specific investment profile. PFR Ventures' maximum contribution to the capitalisation of individual funds ranges from 60% to 80%, depending on the program profile.	The programme, promoted by the OCS, was structured as a fund of funds, making equity investments in hybrid funds without intervening in their operations. The government contributed USD 8 million to each of the ten funds, making up 40% of the total capital raised.
Investment capital	PFR Ventures invested PLN 1.1 billion in VC funds between 2017 and 2023. Meanwhile, the total investment capital, together with private funds, amounted to PLN 1.6 billion (~ USD 400 million).	Total investment capital of USD 250 million (including government funding of USD 100 million)
Investment Focus	Each sub-fund has a specific Investment Focus: - PFR Starter FIZ - investing in companies at the earliest stage of development (incubation, early-stage). - PFR Biznest FIZ - investing in companies at the early stage of development (seed, pre-seed) together with private investors with appropriate capital and experience (Business Angels). - PFR Open Innovation FIZ - investing in technology projects with an R&D component that creates technologies based on the open innovation formula. - PFR KOFFI FIZ - investing in companies at a later stage of development (post-seed rounds). - PFR NCBR CVC FIZ AN - investments focused on a model of generating new ideas, researching, and creating new ventures within existing corporations.	Early-stage investments in high tech startup companies
Form of VC organisations	Depending on the program, VC organisations operate in a standard VC fund, CVC, or co-investment model.	Independent Limited Partnership VC Companies
Requirements for Fund managers	Each candidate fund had to meet the experience and competence requirements of the management team. In addition, individual sub-funds had management team contribution requirements that ranged from 1% to 20% of the fund's total capitalisation.	Each VC fund had to have a competent management team, a reputable foreign VC firm, and a domestic financial institution, which helped foster collective learning and leverage international expertise.
Incentives for investors	Risk diversification through joint investment in a public-private model. In addition, in most programmes there was a follow-on investment option for successful ventures.	Within a 5-year window, investors could buy the government's share at cost, providing strong incentives for professional VC teams.
Impact	Over the period 2017-2023, PFR Ventures invested in more than 380 companies through partnerships with 32 VC funds with funds from POIR. As the investment horizon depending on the programme is 5-12 years most of the investments are still in the development stage, only in the following years with more exits will it be possible to assess success better.	The Yozma fund created a critical mass of VC investment, with most Yozma funds ranking among Israel's top 20 VCs. It spurred high private VC performance, led to follow-up funds and strong capital growth, and served as a model for many other VC companies in Israel.

* PFR Ventures activity during the first edition of the POIR program (2017-2023).

Source: Authors own table with data for PFR Ventures from PFR Ventures. For Yozma program form: Avnimelech (2009) & Avnimelech et al. (2004).

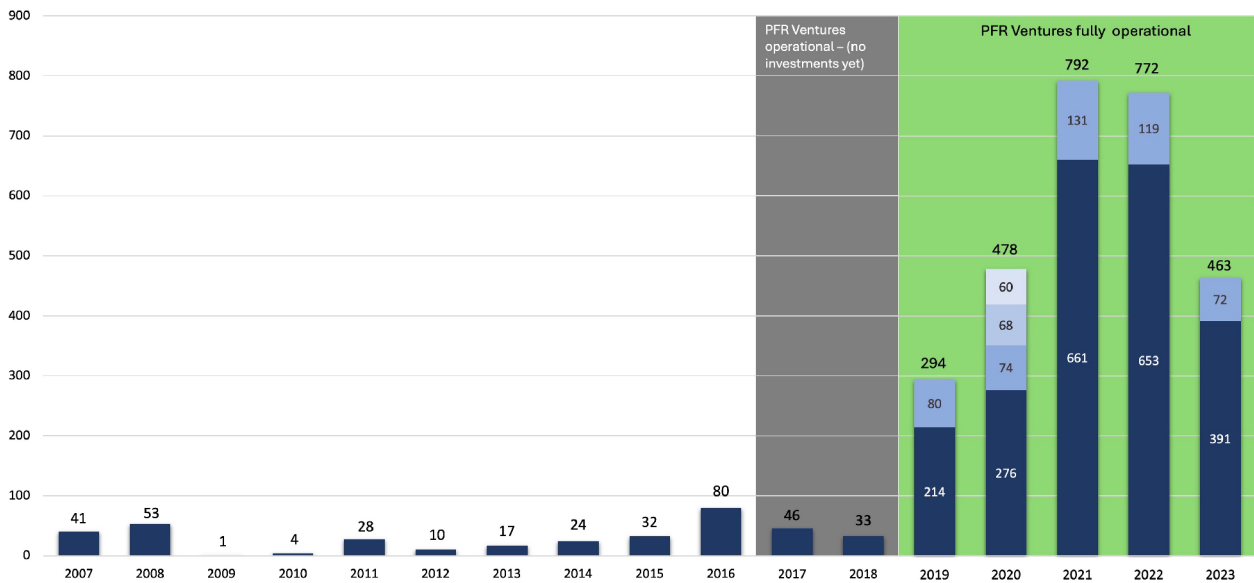


Figure 1. VC investments in Poland 2007-2023 (mln EUR)

*the average annual exchange rates from the National Bank of Poland were used for currency conversions.

Source: own elaboration based on Invest Europe for 2007-2018, PFR Ventures for 2019-2023.

angels) and promote knowledge transfer from individuals with extensive market experience, similar to the previous edition. The new edition of PFR Open Innovation aims to invest through VC funds in small and medium-sized enterprises with an R&D component at both early and later stages. Similarly, to PFR Starter, a key change in PFR KOFFI is the introduction of profit-sharing asymmetry favouring private investors (with a maximum multiplier of 1.5x) and reducing the private contribution requirement to 40%. PFR KOFFI will invest through financial intermediaries in small and medium-sized enterprises at the growth, development, and expansion stages, particularly those looking to expand operations, implement new projects, or enter new markets. PFR CVC, in turn, provides capital to innovative companies through CVC funds co-investing with corporate investors. As illustrated, the general concept of these programmes remains very similar to the first edition (POIR). This time, the public fund's contribution will amount to PLN 2 billion, with an additional PLN 1 billion sourced from private investors to further bolster the VC sector in Poland (PFR Ventures, 2023).

Notably, Zasepa (2015) had already recommended the incorporation of profit asymmetry within the KFK program. However, this solution has only now been implemented at scale with the second edition of PFR Ventures programmes. Moreover, this approach shares similarities with strategies employed in Israel's Yozma programme, as shown in Table 1. This underscores the

parallels in the developmental trajectories of these two countries or the incorporation by Polish policymakers of effective practices from more advanced markets.

The emergence phase in Hungary shares several characteristics with that in Poland. Its onset can also be attributed to a similar period, as both countries' investment volumes rose around the same time. According to Dealroom (2024), the capital invested in the Hungarian VC sector amounted to USD 50 million in 2017, increasing to over USD 110 million in 2018, including a USD 38 million mega-round. As in Poland, the highest investment volumes were seen in 2021 (USD 133 million) and 2022 (USD 206 million).

Examining government interventions during this period, we observe similarities between Hungary's approach and the solutions implemented in Poland and Israel. As Molnár (2021) highlights, in 2020, three out of 26 venture capital fund management companies in Hungary were state-owned—Széchenyi Venture Capital Fund Management (SZTA), Hiventures (formerly CVC FM), and Hungarian Development Bank (MFB) Invest, which, though not an equity fund manager, held investments in multiple funds.

Although SZTA was discussed in the previous phase, it is also worth examining the other two government-backed programmes. Both Hiventures and MFB were active before Hungary entered the emergence phase, yet they merit attention when compared to PFR and Yozma.

MFB operates across a broad financial spectrum, not limited to venture capital. Within the VC sector, its role encompasses three key activities. First, MFB helps distribute EU financial instruments. Second, it owns multiple sub-funds with specific investment objectives, which are managed by external fund managers. Third, MFB owns Hiventures, a state-backed VC investment fund focused on deploying public capital. Over the years, Hiventures has managed numerous government programmes catering to various technology sectors within the VC market.

As Molnár (2021) notes, Hiventures currently serves as a leading direct state investor in the sector, following the earlier indirect JEREMIE program. What distinguishes Hiventures from similar initiatives in other countries is its role during the COVID-19 pandemic, when it managed government relief programmes designed to “rescue” startups by offering highly favourable investment terms.

The rate of government intervention in supporting the VC sector in Hungary is significant. Across all public measures, strong similarities appear among Poland, Israel, and Hungary. However, it is notable that, like in Poland, Hungary’s Emergence phase shares few parallels with the United States, where a strong free market was the primary driver of startup financing.

The surge in investments in the Czech Republic occurred around the same time as in Poland and Hungary, with investment levels doubling from 2018 to 2019. The highest capital inflows were recorded in 2021 (USD 581 million) and 2022 (USD 646 million). At first glance, these figures might suggest that the Czech VC market is the largest among the four countries analysed, but this is not the case. The record-breaking volumes stem largely from funding rounds secured by one of the country’s biggest startups, Rohlik. In 2021, Rohlik raised over USD 309 million across two rounds, followed by another USD 231 million in 2022 (Dealroom, 2024).

Publicly funded initiatives in the Czech Republic have also evolved over time. One key example is the EUR 50 million Czech ESIF Fund of Funds (CZFoF), launched on January 24, 2017, and managed by the EIF. Its goal is to strengthen entrepreneurship and innovation by expanding equity funding for enterprises across early development stages, from accelerators to venture capital. Another significant initiative is the National Development Investment (NRI), a Czech National Development Bank (NRB) subsidiary, which implements equity and quasi-equity

financial instruments using public resources. NRI operates through both direct investments and a fund-of-funds model, focusing on venture capital, private equity, and urban development (EIF, 2023; PFR, 2021).

A more telling way to compare the size of startup ecosystems is to examine the total number of pre-seed and seed funding rounds. According to Dealroom (2024), from 2017 to 2023, Poland led with 1,843 rounds, followed by the Czech Republic with 1,251, and Hungary with 961. Despite lacking the advanced public investment programs in Poland and Hungary, the Czech startup ecosystem remains robust, capturing the second-highest number of early-stage funding rounds among the three CEE countries. Moreover, data from the Czech Republic show that business angel investments and their contributions are more prominent than in the other countries studied.

Comparing these three countries with Israel and the USA, it becomes clear that Israel, Poland, and Hungary share the most similarities, as public initiatives have substantially strengthened their local startup ecosystems. In contrast, despite not having similarly comprehensive government-backed programs, the Czech VC market still developed by relying primarily on private investors during the emergence phase. This renders the Czech model more akin to the USA, where a free-market approach largely fuelled VC investment growth. However, it is also worth noting that, during its emergence phase, the USA VC market had a less developed legal and organisational framework for venture funds than the Czech Republic, where such structures were already in place.

4.1.4. Crisis & Emergence Phase

The crisis phase is the fourth phase in the VC market development cycle outlined by Avnimelech et al. (2004). In the USA, this phase resulted from unfavourable legislation, which led to minimal capital inflows into the VC sector. In Israel, by contrast, the crisis was initially driven by macroeconomic events such as the collapse of the stock market bubble. A broader high-tech sector crisis caused a significant drop in exits of Israeli start-ups and restricted new investments. As Avnimelech & Teubal (2006) observe, the crisis phase can be triggered by a domestic crisis tied to the industry’s evolution or by a global investment crisis emanating from the cyclical downturn in global capital and technology markets. Additionally, Avnimelech &

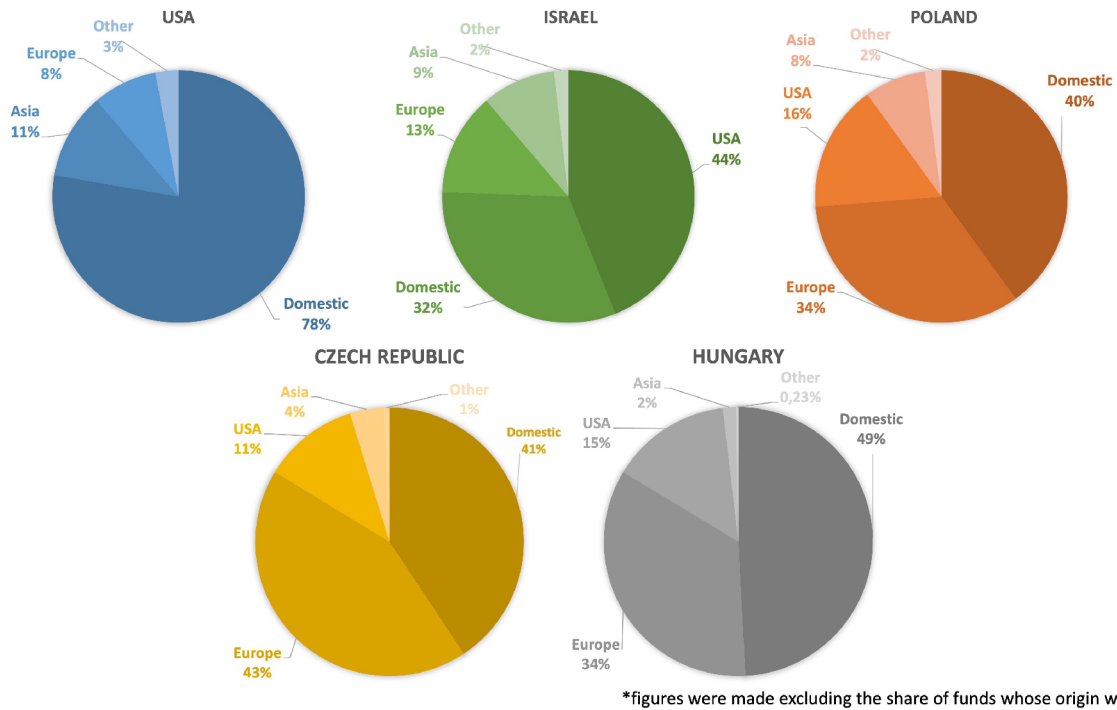


Figure 2. Comparison of the origin of investors in VC markets in the US, Israel, Poland, Czech Republic, and Hungary between 2010 and 2022

Source: own elaboration based on data from Dealroom (2024)

Teubal (2006) highlight overshooting as one of the causes of Israel's crisis.

In the case of Poland, it is challenging to predict a potential investment collapse stemming from internal factors. The recent infusion of capital by PFR Ventures from the FENG program is expected to significantly boost investment in Poland's venture capital sector in the coming years. Although this capital presents a substantial opportunity to continue Poland's rapid VC growth, it also carries the risk of investment overshooting. As in Israel's case, if available capital in Poland continues to grow, less-experienced VCs may enter the market, potentially reducing investment quality and diminishing further growth. Hence, it is crucial for capital providers (such as PFR Ventures) in Poland to uphold standards when selecting management teams.

Turning to Hungary, one can observe a similarly strong influence of government programs on the domestic VC ecosystem. Like Poland, the sector there remains highly dependent on such support. However, upon examining some of the largest investments in recent years, it is apparent that not all deals are government-driven, as both domestic and international private investors are becoming

increasingly active. Given this trend, it is difficult to foresee a crisis in the Hungarian VC market, barring external factors.

For the Czech Republic, predicting a potential VC market crisis at this point is also difficult. Nevertheless, the risk factors may differ from those in Poland and Hungary, given that private investors play a more significant role in Czech start-ups' funding. The Czech startup ecosystem will face significant risks if private investors withdraw or fail to raise sufficient capital. Because there is not yet a large and stable state support mechanism for investment, the Czech Republic remains more vulnerable to market fluctuations.

Looking further at the Polish case, it becomes clear that the global market situation poses a greater threat to Poland's VC market than domestic factors. As illustrated in Figure 2, only 40% of the capital in Poland's VC market originates from domestic investors. Similarly, 41% of VC capital in the Czech Republic is domestic. Hungary, at nearly 50%, boasts the strongest domestic capital rate among the CEE countries studied. Nonetheless, this underscores the influence of global risks—especially when compared to Israel, whose market, although highly developed,

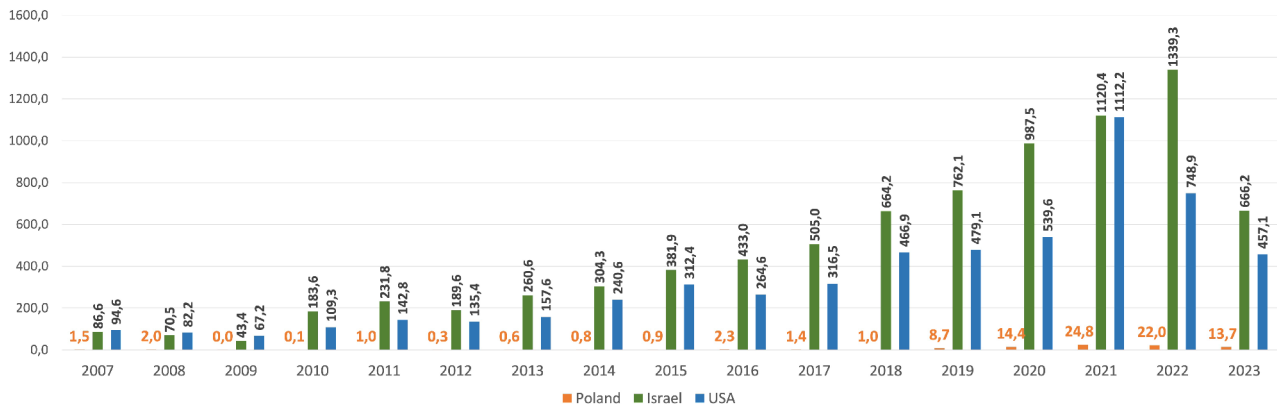


Figure 3. Comparison of VC investment per capita in the USA, Israel, and Poland between 2007 and 2023 (USD)
Source: own elaboration based on data for VC investments for USA & Israel from Dealroom, for Poland from PFR Ventures & Invest Europe; and population data from World Bank

felt the impact of the 2008 global crisis. In contrast, the USA's VC market shows notable strength and resilience, with nearly 80% of its capital coming from domestic sources. Such a high proportion of foreign investors in Poland and other CEE markets could significantly curtail—and potentially halt—VC development should a global crisis prompt their withdrawal. In the short term, this risk is difficult to mitigate.

Poland is expected to enter a consolidation phase earlier than the other Central and Eastern European countries examined. Thus, the following VC per capita analysis and broader long-term potential overview focus solely on Poland's VC market contrasted with the USA and Israel.

As Avnimelech et al. (2004) and Avnimelech & Teubal (2006) explain, the USA and Israel experienced consolidation and subsequent resilience for several years during this phase. Although the Polish VC market has expanded rapidly, it still has far to go before consolidating. This is apparent in data on VC investment amounts per capita. In Poland, the average investment per capita from 2007 to 2023 was USD 5.6, compared to USD 337 in the USA and USD 484 in Israel. Even in Poland's best year, 2021, per capita investment reached only USD 24.8, while in the same year, both the USA and Israel exceeded USD 1,100. Despite Poland's VC market growing faster than the other analysed CEE countries, it still lags significantly behind the USA and Israel, which have remained in a consolidation phase for many years.

Regarding Poland's long-term VC prospects, one key indicator to watch is the number of successful exits—particularly IPOs—since they have profoundly

impacted market consolidation in both the USA and Israel. Furthermore, as seen in these countries, the expansion of domestic VC funds into foreign markets deserves attention during the consolidation phase.

Estimating when Poland will reach the consolidation phase remains complex. In the USA, consolidation began 50 years after the initial background phase, whereas in Israel, it took 34 years. Considering that Poland's VC market has existed for about 35 years (as of 2024), it may enter consolidation sooner than the USA. However, Israel's faster progression through these phases suggests that Poland's timeline could also vary greatly.

5. Discussion

The article's main aim was to identify similarities between the development of the CEE VC markets and those of the USA and Israel while explicitly examining how the five-phase framework might need adaptation in transition economies. However, it focuses primarily on reference to the literature and results for Poland. It is the largest market, and there is more data about it.

It was possible to identify similarities between the early stages of the VC market, what shaped them in CEE countries and how this compares to the USA and Israel. In addition, it was possible to indicate that the Polish market has completed the first two phases (background conditions and pre-emergence) and is now in the emergence phase. Similarities in the context of the development phases and in the mechanisms used by the government were also identified. Moreover,

similarities were also found in Hungary and the Czech Republic, although the Hungarian VC market resembled the Israeli case and the Czech market more than the one in the USA.

In addition, the study showed that Poland will probably still face two phases (crisis and consolidation). However, historical data concerning investments per year suggests the crisis phase may have already occurred in 2009–2010 (see Figure 1) when the low investment volume was likely driven by capital outflows from the VC sector following the global financial crisis in 2008. Moreover, looking at the overall development of the VC market, an almost equally low volume of capital was invested in the later years (2012–2013). While indeed these two periods may raise doubts about the classification of phases in Poland, they can be explained by three arguments.

First, capital shortfalls during this period can be attributed to several factors. The most important reason for the first decline can be explained by the above-mentioned crisis of 2008. However, according to Block & Sandner (2011), research from the market in the USA shows that the VC sector, despite recording significant declines in the volume of investments during the crisis, had already returned to pre-crisis levels by mid-2011.

On the one hand, it is worth noting that the crisis reached Poland with some delay. Nazarczuk (2013) indicates that its biggest effect on the slowdown of the Polish economy took place in 2009. This would align with the data presented in Figure 1, where we can see a massive drop in investments in 2009 and not 2008.

However, in Poland, the return to pre-crisis values did not occur for many more years until 2015. Thus, although the crisis arrived late in Poland, the recovery process took much longer than in the USA. Helping to explain these declines may be research conducted by Carpenter & Petersen (2002), which has shown market imperfections (mainly information asymmetry) as one of the problems of raising funds by small high-tech companies. In Poland, there were already government measures in this period to support the VC sector by taking on some of the risks associated with information asymmetry. Nevertheless, looking at the data on the number of investments from this period, even with government support after the global crisis, they were insufficient as the level of investment was still very low and did not return to pre-crisis levels for a long time.

Second, the findings suggest that the Avnimelech et al. (2004) model is robust across heterogeneous

settings, but the role of foreign capital and EU structural funds constitutes an additional factor not originally emphasised in their framework. Looking at the data on the amount of VC investments per capita (see Figure 3), we see another justification for the choice of Poland's current development phase. Hypothetically assuming the crisis phase in 2009–2010 or 2012–2013, Poland should now be well into the consolidation phase. Such a classification would be wrong because it would imply that the Polish VC market would be on par with Western VC markets, as it would be in the consolidation phase for at least ten years (since 2014). However, as can be seen in Figure 3, despite the implementation of large amounts of capital through the intervention of the Polish government, the VC market is still far behind the USA and Israel regarding the amount of capital invested per capita. This reinforces that transition economies may experience “partial” crisis events without a full progression to the next phase if foundational ecosystem elements—like private investor confidence—remain underdeveloped.

Thirdly, the Polish government's current policy of support for the sector, which coincides with those measures also taken by the authorities in Israel in the emergence phase, reinforces this.

In Israel, this phase was dominated by the success of the Yozma program, which operated between 1993 and 2000 and was crucial to developing the Israeli VC sector (Avnimelech, 2009). In the USA, the SBIC programme was also operational during that phase. That's why it is very likely that a similar situation may be taking place in Poland today. Many of the startups supported by the PFR Ventures programme are currently in the growth phase, and it is very difficult at this point to predict their long-term success. As of today, data from PFR reports shows a significant increase in both investments and the number of active funds, indicating, so far, the very positive impact of this programme (PFR Ventures, 2024).

To clarify any remaining uncertainties, a stronger empirical dimension—such as basic quantitative tests of investment patterns or exit performance—would be valuable in confirming the impact of these government-led programs. To verify the current classification and confirm the impact of the current positive data, it would be crucial to revisit this study in a few years and to analyse the success of exits of Polish start-ups supported by PFR Ventures in comparison with the Avnimelech (2009) study indicating exits from the Yozma programme. This would provide information on whether the PFR Ventures programme was as

Table 2. Comparison of major events in the evolutionary phases of the USA, Israel, and Poland VC industries

Phase	USA	ISRAEL	POLAND
Background Conditions	1930-1945 - World War Two and technological race (Cold War) - Public R&D capital going to the military and high technology sector - No VC organisations present	1970-1989 - Six-Day War and France issuing embargo on Israel - Public R&D capital going to the military sector and high technology US corporations entering Israel - BIRD program promoting R&D links with the USA - Appearance of first formal VC companies	1989-2004 - Collapse of the communist system and subsequent systemic transformation and privatisation of enterprises - Need for influx of capital in high technology sector to reduce the technology gap. - Very fast appearance of formal VC/PE found operating in an aid capacity as well as privately.
Pre-Emergence	1945-1957 - Creation of professionally managed VC organisations linked to wealthy families - First formal VC organisation (ARD) - continued large investments in R&D - Initiatives made by universities to connect companies with talented students	1989-1992 - Continuation of technological revolution - Strong immigration of qualified personnel - More VC organisations enter Israel - Government support programs for the VC market: Technology Incubator, Magnet, Inbal	2004-2017 - Accession of Poland to the European Union - Appearance of capital from EU structural funds. - Government support programs for the VC market: PARP, KFK, NCBR
Emergence	1958-1972 - First LP VC organisation (DGA) - Government SBIC program - Rise of integrated circuits computer technology - Establishment of NASDAQ and listing of Intel - Continued large investments in R&D	1993-2000 - Government support programme Yozma aimed at the creation of a competitive VC industry through public-private partnerships. - Israeli startups can IPO on NASDAQ - Rise of software and communication technologies - Substantial increase in the number of active VC funds in the country	2017- - Launch of Government organisation PFR Ventures to support the development of the local VC market and innovation ecosystem - Substantial increase in the number of active VC funds in the country
Crisis	1972-1980 - ERISA regulations reducing inflows in the VC sector due to stringent regulations on pension fund managers - Very little VC capital raised	2001-2003 - Collapse of stock market bubble - Significant reduction in capital raised - World capital market crisis and high technology crisis - Reductions in R&D grants support - Liquidity problems of VC funds due to the lack of capital - Overshooting of VC investments in the Emergence phase	
Consolidation	1980- - Relaxation of ERISA regulations - Pension funds and other institutions have become dominant investors in VC. - Successful IPOs of technological companies (e.g., Apple) - Growth of VC clusters like Silicon Valley - Reorientation of the R&D sector from military to civilian applications.	2004- - Increase in capital raised by VC funds - Increase in IPOs and other forms of startup exits - Israeli VC managers successful abroad	

Source: own elaboration based on data for the USA and Israel from Avnimelech et al. (2004) and Avnimelech & Teubal (2006)

groundbreaking for the Polish market as Yozma was for Israel.

Given the example of the USA and Israel, it can be noted that strong government efforts to support the development of the VC sector are characteristic of the emergence phase, while they are far less frequent in the consolidation phase. Therefore, according to the data presented in the study and the arguments presented above, the author assumed the current phase of development of the venture capital market in Poland to be emergence. Nevertheless, further quantitative analysis (e.g., regression-based or difference-in-differences techniques) could substantiate how well Poland's trajectory aligns with or diverges from Israel's, particularly in measuring the long-term resilience of the sector after initial public funding is tapered.

6. Conclusion

The study compares the development phases of the venture capital market in Poland, Hungary, and the Czech Republic with those described earlier in the USA and Israel. Despite the significant differences in the timing of their emergence, clear similarities were identified. The findings suggest that the Polish VC market is currently the strongest and largest among the analysed CEE countries, with the Czech and Hungarian markets following behind. While many similarities were found between the development of the Polish and Hungarian markets and the earlier evolution in Israel, the Czech Republic—though shaped by similar background conditions—followed a more market-driven trajectory, loosely paralleling the USA.

Although the data indicate Poland is in the emergence phase, it remains far from the per capita investment levels seen in Israel and the USA, reflecting persistent gaps in private capital availability and exit maturity. Yet, strong government interventions—via tools such as PFR Ventures—demonstrably bolster the emerging startup ecosystem. Hungary's experience mirrors Poland's dependence on public-private partnerships, whereas the Czech Republic's more private-sector-focused rise underscores that diverse institutional pathways can still foster robust venture ecosystems.

Additionally, the paper underscores that future research should consider systematic quantitative

methods to verify how effectively current policy interventions, like PFR Ventures, propel the VC sector from emergence to eventual consolidation. Such empirical analyses would also help determine whether partial crisis dips (e.g., 2009–2010) indicate an extended timeline to consolidation or simply represent transient setbacks in otherwise steadily growing venture capital markets. A stronger dataset on exit dynamics, IPO volumes, and follow-on funding would thus provide clearer evidence on whether these CEE countries can replicate, adapt, or accelerate the five-phase trajectory documented in Israel and the USA. Ultimately, the results highlight the broader applicability of Avnimelech et al.'s (2004) model in transition economies, albeit with modifications for foreign capital influence, EU structural funds, and region-specific policy frameworks.

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