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OF BUSINESS

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Entrepreneurship from User-Industries

Presentation prepared for the

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Agenda

- Propose a new type of entrepreneurship that may foster industrial growth in an economy.
- Identify a new category of entrepreneurial ventures called *user-industry spinouts*.
- Present my research on user-industry spinouts in terms of:
 - Their significance
 - Their entry strategies and performance over time
 - Their location choices
 - Their potential to be acquired
- Introduce ongoing research on vertical spinouts from both upstream and downstream industries.

Our contribution

The research presented here has been conducted with Prof. Franco Malerba (Bocconi University, Italy) and Prof. Roberto Fontana (Pavia University, Italy)

- This research highlights the need for a more inclusive approach to entrepreneurship that involves new firms that may cross industry boundaries.
- This research enriches our understanding of the links between vertically related industries.
- It also widens the lens for both investors and policy makers concerning the source of entrepreneurship in high technology industries.

Our starting point: Industry spinouts (or spinoffs)

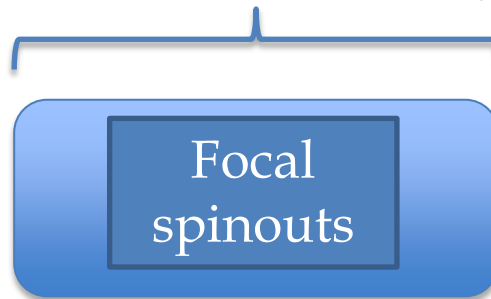
Industry spinouts are new, independent firms founded by the ex-employees of existing firms in an industry.

e.g. Intel was founded by ex-employees of Fairchild (another semiconductor producer in the Silicon Valley)

They constitute a large part of new entrants and are key players in the dynamics and evolution of industries.

The traditional view of entrepreneurship: intra-industry spinouts

New firms founded by ex-employees of firms in the same, focal industry



Research in management and economics has focused on intra-industry spinouts (new independent firms from existing firms within the same industry); the literature proposes a set of theories and has identified several stylized facts about the formation and performance of intra-industry spinouts.

(Agarwal et al., 2004; Franco and Filson, 2006; Klepper, 2001, 2002; Chatterji, 2009; Dahl and Sorenson, 2011)

A broader view: Entrepreneurship in a value chain perspective



(Shane, 2004; Lowe and Ziedonis, 2006; Clarysse and Wright, 2011)

(Agarwal et al., 2004; Franco and Filson, 2006; Klepper, 2001, 2002; Chatterji, 2009; Dahl and Sorenson, 2011)

(Shah and Tripsas, 2007; Shah, Winston Smith, Reedy, 2012; Shah, Mody, 2014)

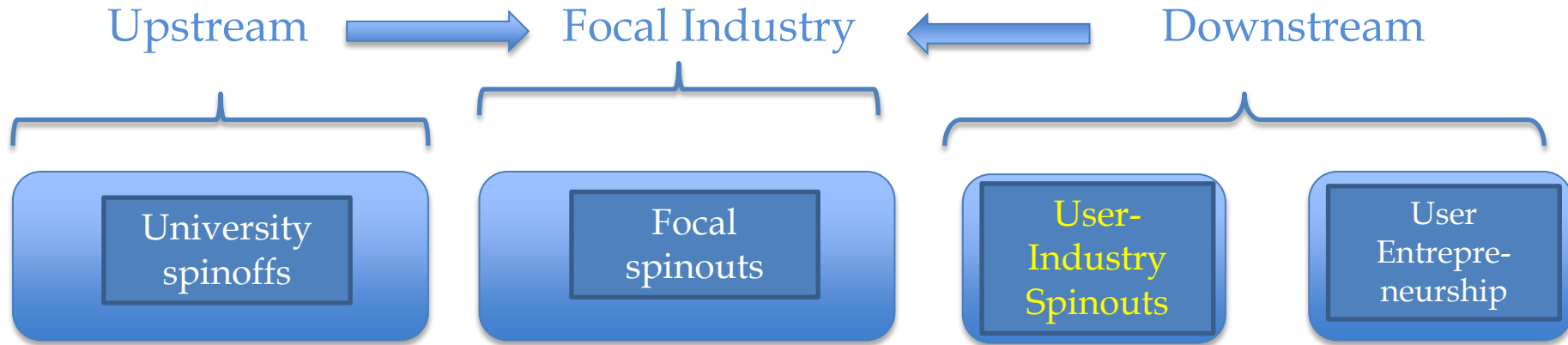
The knowledge heritage of entrepreneurs



Spinouts may be drawn from **different knowledge contexts** related to the origin of their founders.

Founders originating from distinct knowledge contexts have different information advantages. This may affect their entry choices and performance.

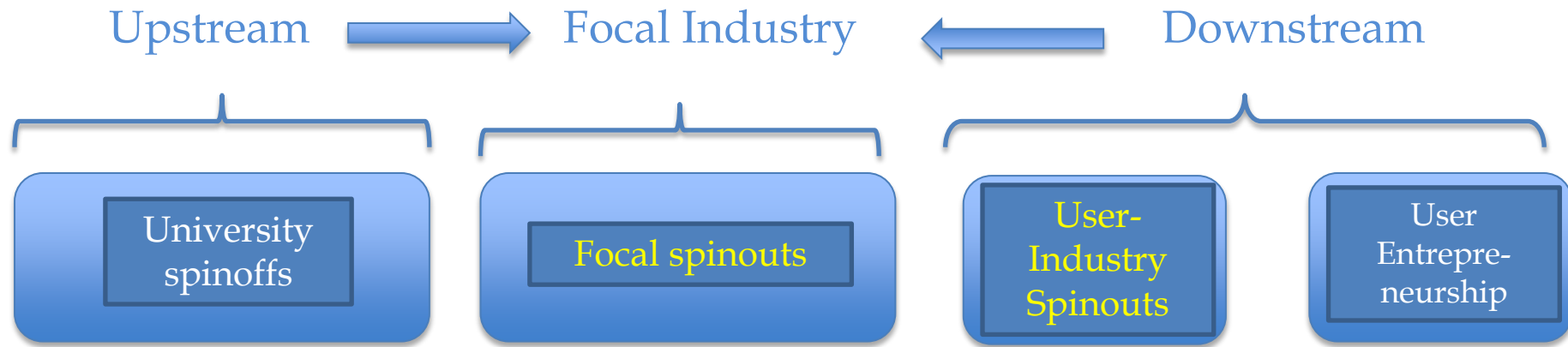
An industry view of the value chain perspective



What are user-industry spinouts? :

Independent start-ups in the focal industry founded by ex-employees of firms in downstream, intermediate industries that use technologies or component parts from the focal industry in their products or production processes.

An industry view of the value chain perspective



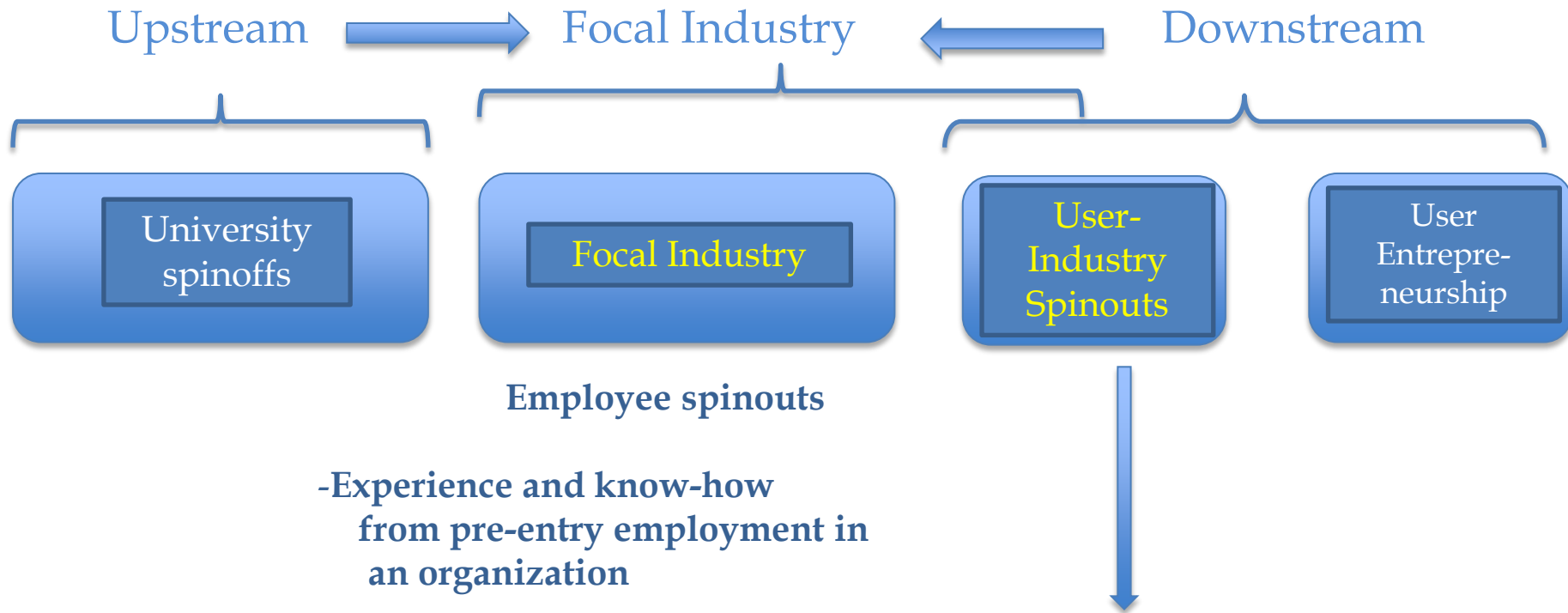
User-industry spinouts are a significant share of new entrants in high-technology industries

We found that 30% of the 936 semiconductor entrants in the US between 1997 and 2007 were spin-outs whose founders come from downstream industries: telecommunications, computers, auto, industrial equipment, consumer electronics, defense, etc.

Industrial demand is a source of entrepreneurship.

Adams, Fontana, Malerba, Research Policy (2013)

The knowledge heritage of user-industry spinouts



User-Industry Spinouts:

applications

- have knowledge of user

- can recognize unmet needs of users

- are immersed in problem context

- are part of wider community of

users

The knowledge heritage of user-industry spinouts

- The knowledge context of new entrants from user-industries differs in several respects from that of spin-offs from an incumbent industry:
 - User firms will likely have lower levels of *marketing knowledge* in a broad range of products markets in the new focal industry, but higher levels of *marketing knowledge* in the downstream industry.
 - They also have a *direct experience* with customers, with industry associations, with sales and distribution networks, with regulatory practices and standards in the downstream industry.
 - Entrepreneurs with previous experience in a user firm are likely have *technological knowledge* coming from deep and contextual experience with products and applications in the downstream industry and focused on the specific application area of the use of the products or components: we call this *application specific knowledge*.
 - Users are driven to innovate and become entrepreneurs by *motivations* based on the objective to find solutions to their own, particular needs.

Knowledge heritage and entry choice

- The former knowledge context of new entrants affects not only the generic choice of entry, but also more specific decisions concerning product-markets.
- Entry choices are affected by the match between pre-entry resources and capabilities and the target market selected.
- In our case, the most relevant distinction is between:

Generic products

Products that are sold indistinctly into multiple markets with no need of customization or adaptation

Market-specific products

Products that respond to the distinct needs of specific customer categories that stem from requirements in an application area or from a desire to differentiate a final product through the use of components.

User-industry spinouts : Our first research question

If user-industry spinouts are significant in number,



Do user-industry spinouts behave and perform like intra-industry spinouts and other new entrants? Does their knowledge heritage affect their product choices at entry?

Empirical analysis: the semiconductor industry

- Sample: 936 independent start-ups
 - All *de-novo* entrants founded between 1997 and 2007
 - Survival traced up to 2010

Classified as

- **Focal Spinouts** (the founders originate from semiconductor firms)
- **User-industry Spinouts** (the founders originate from firms in a downstream, user industry)
- **Other startups**

Product choice at entry

- **Generic semiconductor products**
- **Market specific semiconductor products**

Findings

- **User-industry spinouts are more likely to enter, and survive longer, in market-specific product areas related to downstream industry segments.**
- Entry and survival rates of user industry spin-outs are different from those of other *de novo* start ups and that these differences relate to the knowledge context of the founders' previous experience.
- The resources that new firms draw from a downstream knowledge context provide a better match with those product categories that require some adaptation to, or integration with, downstream markets and applications.

Findings

- Further evidence of this conclusion comes from user-industry spin-outs with *single founders*:
 Most of entrants with single founders went into the same sub-market in which their founders were previously employed.

Table 10: Entry of user industry spin-outs in market specific semiconductor by submarket and industry of origin

		Industry of origin				TOTAL
		Communications	Computing & storage	Consumer products	Industrial & other	
Submarket of entry	Communications	9	0	0	1	10
	Computing & storage	1	1	0	1	3
	Consumer products	2	0	4	1	7
	Industrial & other	0	0	0	4	4
TOTAL		12	1	4	7	24

Note: restricted dataset of single founder firms

User-industry spinouts: Our second research question

If user-industry spinouts make different strategic choices at entry in terms of product/market strategy



Do user-industry spinouts also make different location choices than focal spinouts based on their knowledge heritage?

Location choices of start-ups

What does the theory say?
Location choices determined by:

Family, friends, social capital

Such capital assists in understanding the local context, identifying opportunities, and mobilizing resources

Dahl and Sorenson, 2009,2011;
Sorenson and Audia, 2000;
Figueiredo et al., 2002)

Agglomeration economies

A higher density of firms in the same industry may provide entrants with advantages of specialized labor markets, strong supplier networks and knowledge spillovers

Marshall, 1920; Nachum and Keeble, 2003; Berchicci et al., 2011)

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Does spinout type
and product strategy
affect location
choice?

The empirical analysis: Location economies

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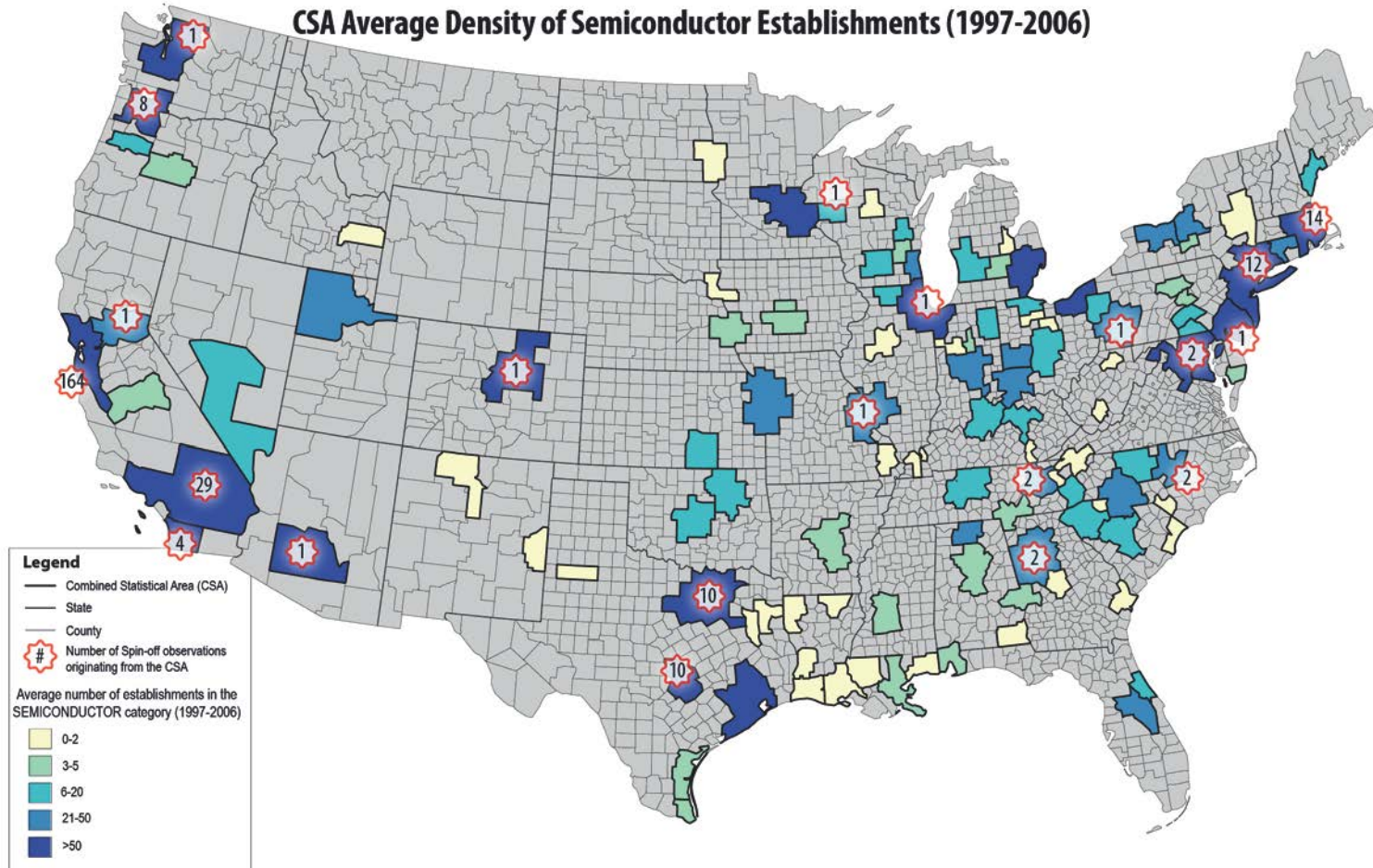
Product choice at entry

- Generic semiconductor products
- Market specific semiconductor products

Reconstructing the location of firms

- 113 Combined Statistical Areas (CSAs)
- Density of semiconductor firms or user firms in area
- Methodology
 - Conditional Logit Model to estimate at each point in time t the probability for a new firm originating in CSA i to choose CSA j
 - Separate results for those that stay in their home region and those that locate in a different region than parent.

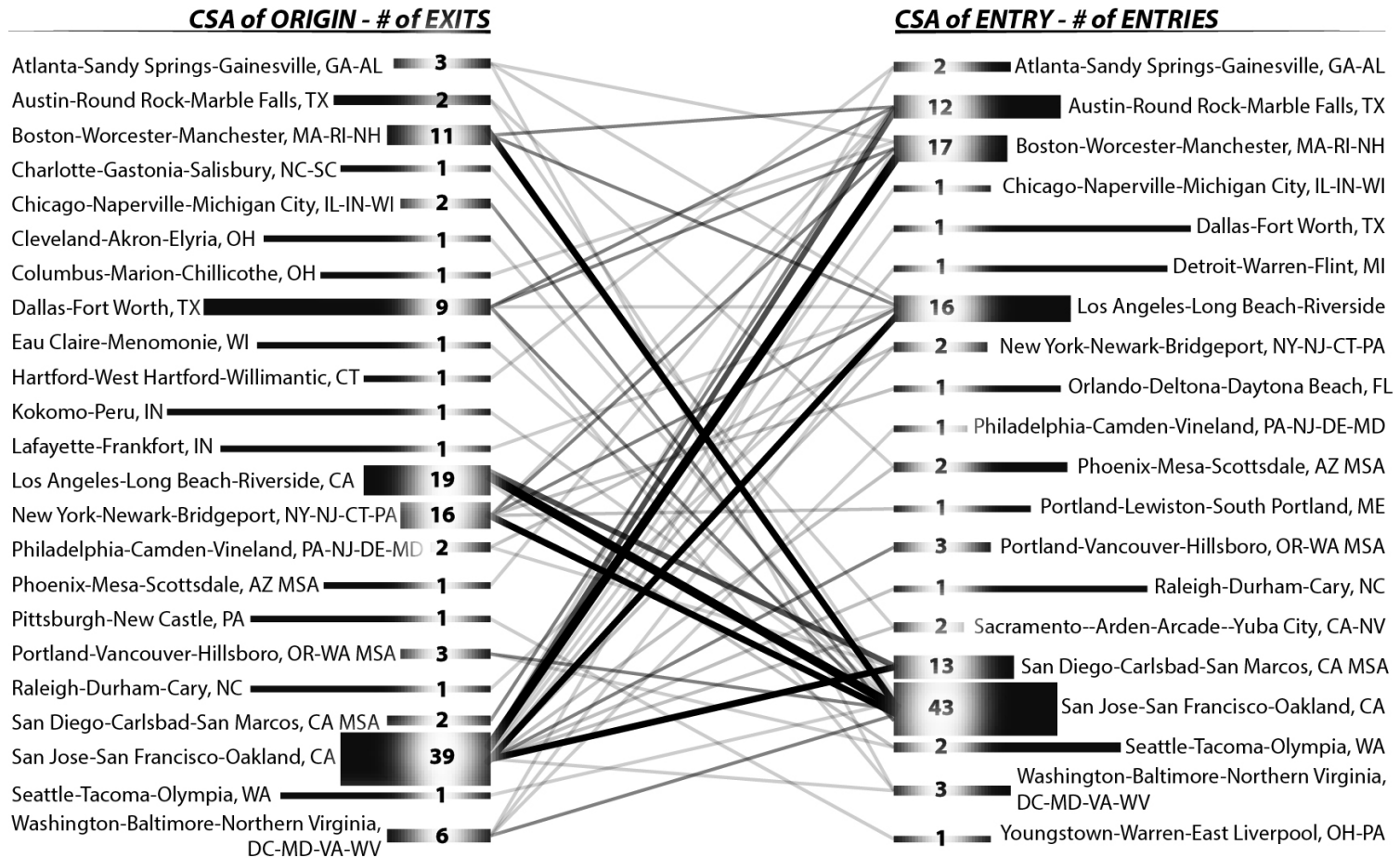
Localization descriptives: semiconductor industry density



Findings

30% of new firms locate away from home area:
careful about assumptions that spinouts tend to stay near parent!

MIGRATION PATTERNS OF OBSERVATIONS ACROSS CSAs



Thickness and opacity of lines reflect frequency of observations. Only moving observations, i.e. firms that experience migration, over the 1997-2006 period are considered.

Findings

For firms that do not stay in their region of origin (*they loose their social capital*):

WHO YOU ARE/WHAT YOU DO

User-industry spinouts
with Generic Products



WHERE YOU LOCATE

FOCAL INDUSTRY
(complementary knowledge)

Focal industry spinouts
with Market Specific Products



USER INDUSTRY
(complementary knowledge)

Findings

The match between capabilities and product requirements affects the importance of location characteristics

Family, friends, social capital

Such capital assists in understanding the local context, identifying opportunities, and mobilizing resources

Agglomeration economies

A higher density of firms in the same industry may provide entrants with advantages of specialized labor markets, strong supplier networks and knowledge spillovers

Who you are
(initial capabilities)

What you do
(product strategy)



User-industry spinouts : Our third research question

If user-industry spinouts make different strategic choices at entry in terms of product/market strategy



Does the knowledge heritage of user-industry spinouts affect their potential to be acquired?

Research on Acquisitions

- Acquisitions have become increasingly important in high technology industries given the speed of innovation and the cost of new product development.
- Acquisitions represent a means to assimilate the knowledge and capabilities of target firms.
- Yet, what acquirers look for when assessing targets remains an open question.
- Most research focuses on *knowledge relatedness* between buyer and target firm.

Knowledge assets: a challenge for the acquisition of new ventures

- New ventures often enter industries without proprietary patents. It may take years for a new entrant to build a patent history.
- New ventures often enter an industry with a single or narrow product offering. What they *produce* may not be an accurate reflection of what they *know*.
- New ventures may have more limited resources and capabilities at entry (i.e. marketing, manufacturing, R&D).

Knowledge heritage as an indicator of knowledge resources

- The specific resources and capabilities of new entrants – *and especially spinouts* – may be understood by looking at the knowledge and experience inherited through their founders.
- Entrepreneurial origin is an important source of knowledge resources and capabilities.

Empirical analysis: the semiconductor industry

Target Firms

Classified as

- Focal Spinouts (the founders originate from semiconductor firms)
- User-industry Spinouts (the founders originate from firms in a downstream, user industry)
- Other startups

Product choice at entry

- Generic semiconductor products
- Market specific semiconductor products

Buyer Firms

- We distinguish between two types of buyer firms:
 - Established firms in the *focal industry* - producing generic or market specific products
 - Established firms in *downstream user industries*

Findings

- **Spinouts from the focal industry –**
are likely to be acquired by all types of buyers *independent*
of their product strategy

Findings

- **Spinouts from user industries** –
are likely to be acquired *depending* on their product strategy

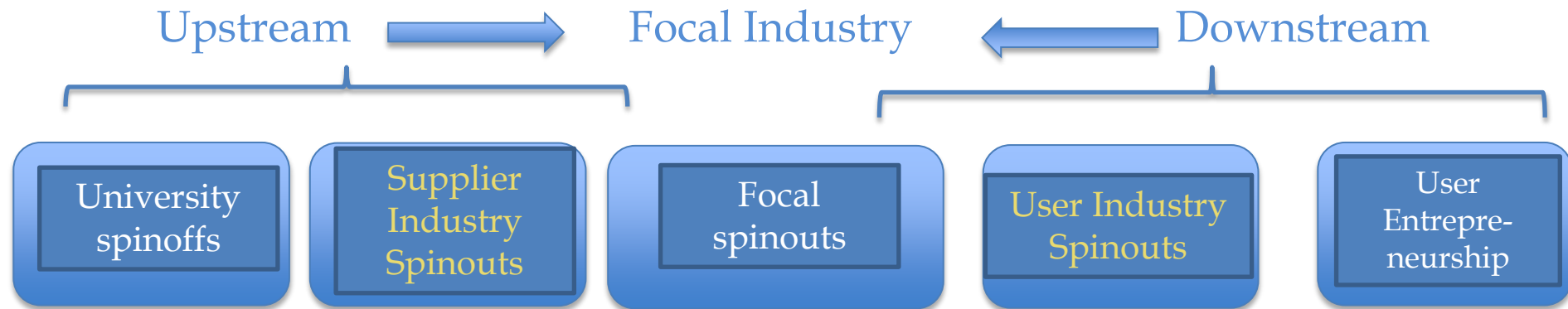
User industry spinouts that **produce generic products** are not likely to be acquired by any type of buyer.

User industry spinouts that produce **market specific products** are likely to be acquired by focal firms that produce market specific products or by user buyers.

Findings

- Past research shows that knowledge heritage matters for entry decisions and performance (i.e. spinouts have higher likelihood of survival than other new entrants).
- My research shows that different types of spinouts also adopt different product strategies at entry and have different survival rates in different markets.
- This study further extends these studies to show that knowledge heritage also matters for exit by acquisitions.
 - Spinouts whose founders originate from distinct knowledge contexts have a different potential to be acquired by specific types of buyer firms.

The expansion of the concept



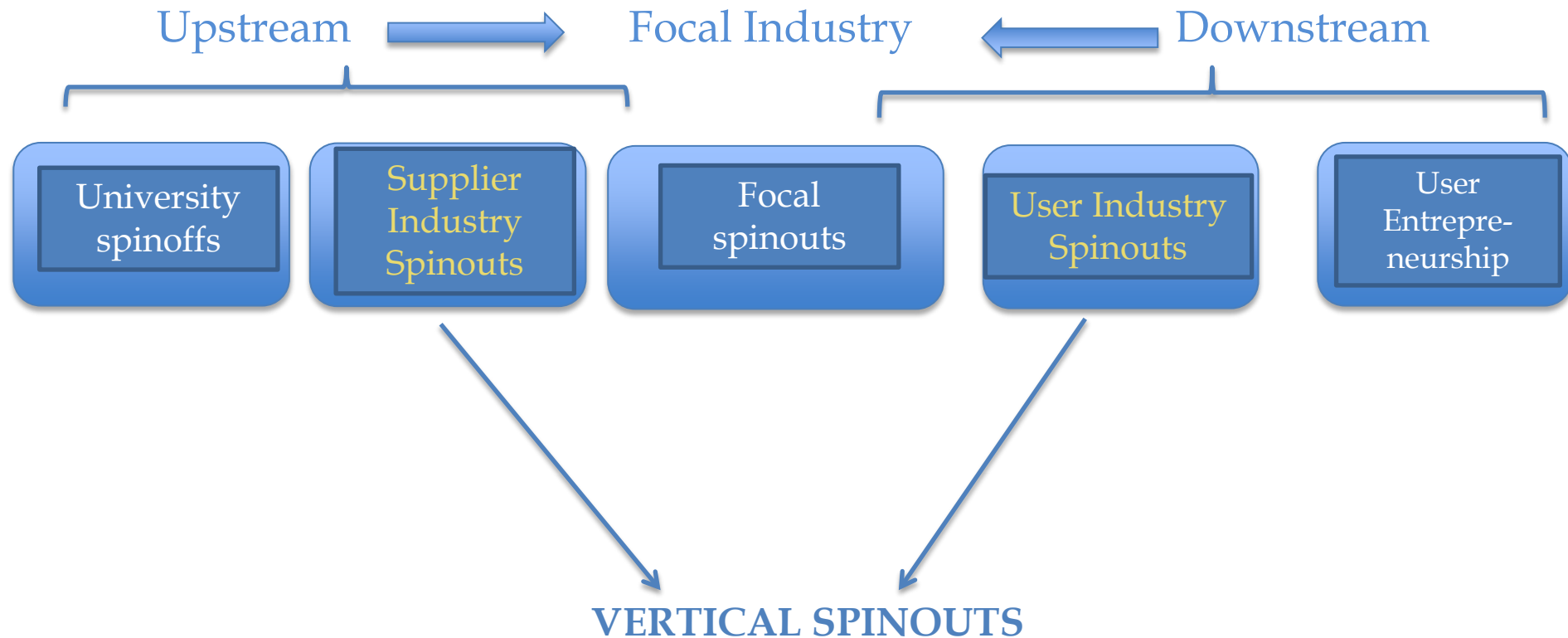
USER-INDUSTRY SPINOUTS

Independent start-ups in the focal industry founded by ex-employees of firms in downstream Industries that use technologies or component parts in their products or production processes

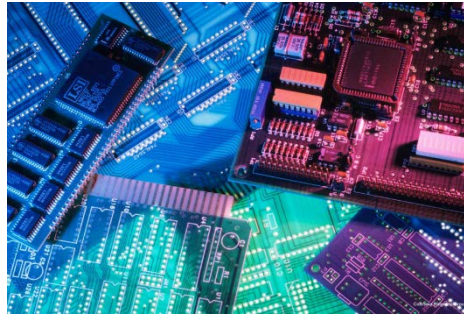
SUPPLIER-INDUSTRY SPINOUTS

Independent start-ups in the focal industry founded by ex-employees of firms in supplier industries

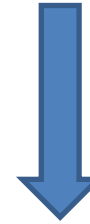
The expansion of the concept: vertical spinouts



The research context



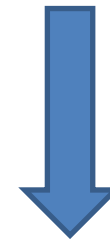
Semiconductors



VERTICAL SPINOUTS

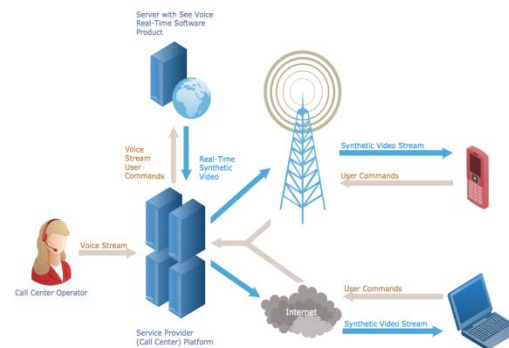


Telecom equipment



VERTICAL SPINOUTS

Telecom Networks Connectivity



VERTICAL SPINOUTS



VERTICAL SPINOUTS



Preliminary findings

Vertical spinouts (from both upstream and downstream industries) survive longer than other new entrants.

Preliminary findings...

- We find that vertical spinouts represent a **new organizational link** between vertically related industries, in addition to vertical integration and inter-firm alliances and networks.
- In the case of vertical spinouts, **knowledge is transferred across industry boundaries** through the formation of new and independent firms. In vertical spinouts integrated knowledge is shared within a specialized organization that operates only in one industry.
- Our findings also bring strong evidence that knowledge redefines and **broadens the contours of an industry** because it crosses rigidly delimited industry boundaries through the formation of vertical spinouts.

Conclusions

- This research highlights the need for a more inclusive approach to entrepreneurship that involves new firms that cross industry boundaries and bring new knowledge into related industries.
- This research enriches our understanding of the links between vertically related industries. Knowledge may be transferred not only through vertical integration and personnel mobility, but also through the formation and growth of new firms with experience in a vertically related industry.
- The concept of vertical spinout opens opportunities for both investors and policy makers by highlighting a yet unexplored source of entrepreneurship in high technology industries.

Thank you for your attention.