

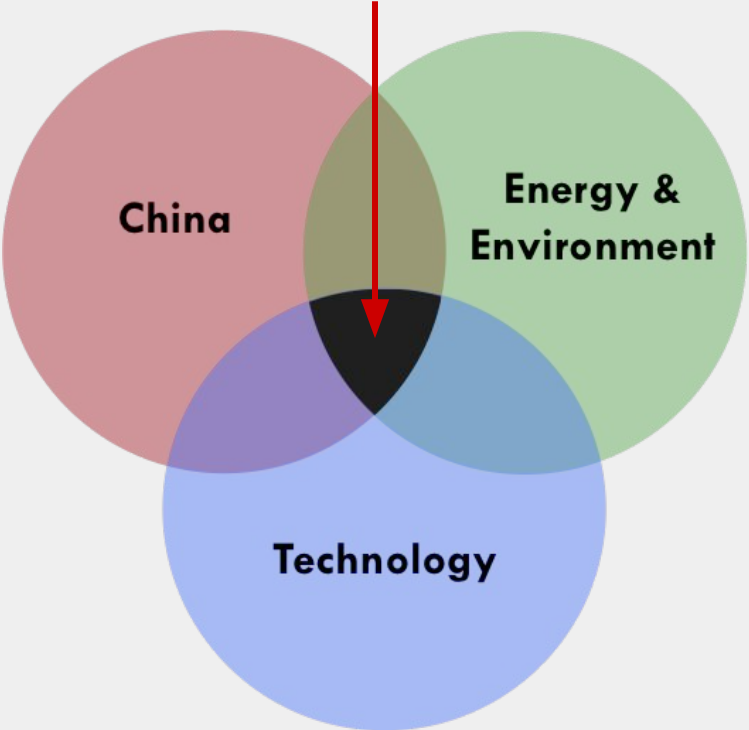
# Up, Down, and Sideways: Innovation in China and the Case of Plug-in Electric Vehicles



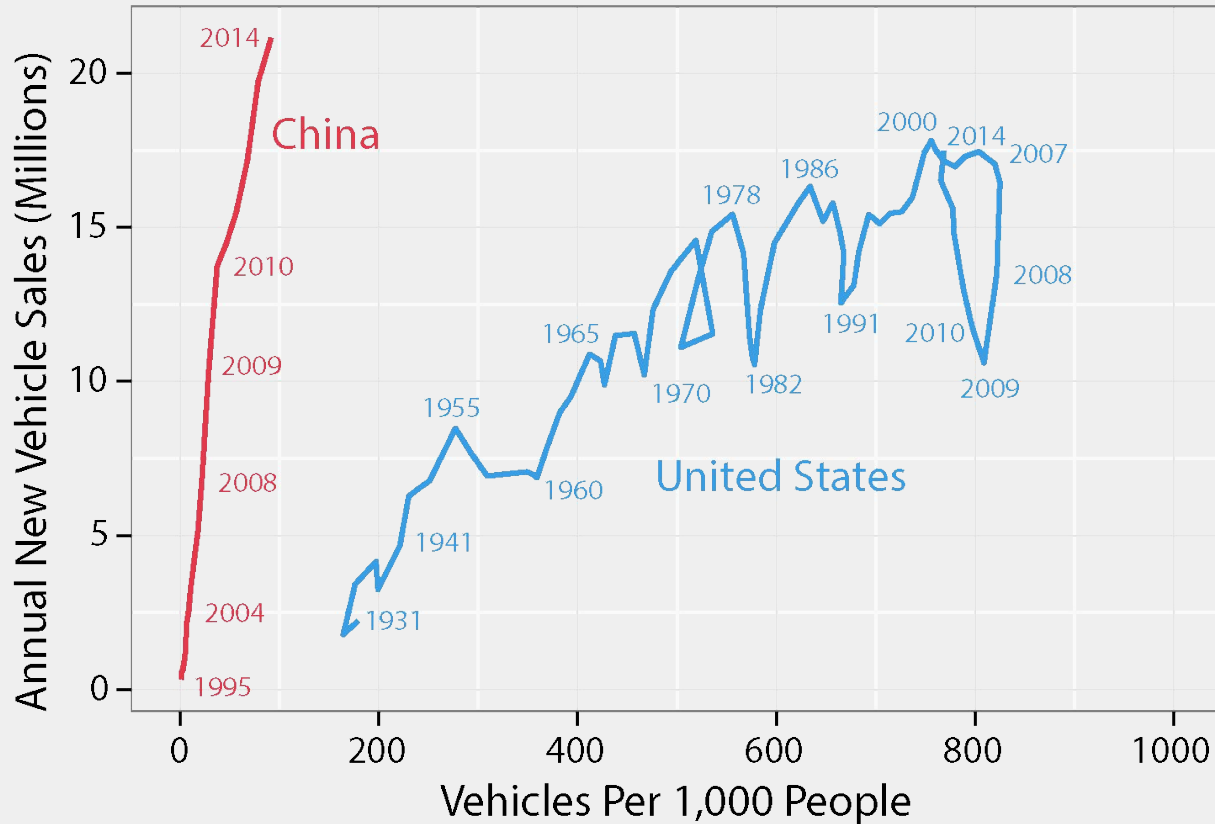
John Paul Helveston

Carnegie Mellon University

**Electric Vehicles**



# China: World's largest vehicle market & room to grow



### 3-Paper Thesis:

What is shaping the development and adoption of PEVs in China?

Topic	Approach	Finding
Demand	Conjoint Survey	<i>Chinese more receptive to full electric vehicles than Americans</i>
	Simulation Experiment	<i>Pooling survey and market sales data could worsen parameter estimates</i>
Production	Qualitative / Mixed	<i>Independent Chinese firms are leading China's PEV market with wide variety of innovations</i>

# Scholars suggest innovation in China limited to mass production

## Past Research

Firms trapped in low value-added niches

Brandt et al., 2010; Steinfeld, 2004; Ge et al., 2004; Puga & Trefler, 2005

Innovation for cost reduction

Ernst & Naughton, 2008, 2012; Breznitz & Murphree, 2011; Herrigel, 2010; Nahm, 2012

## This Work

Firms leveraging *business strategy* and *technology* innovations to access low and high value-added niches

Innovation for diverse markets

# Scholars suggest joint venture system limits innovation

## Past Research

JV system creates disincentives to innovate

Nam, 2011, 2012; Howell, 2016

## This Work

JV system *enabling* domestic innovation in PEV sector

# Inductive grounded theory-building

## Vehicle Sales Data

Make & Model  
Jan. 2003 – Dec. 2014  
Annual: CAAM  
Monthly: Gasgoo.com

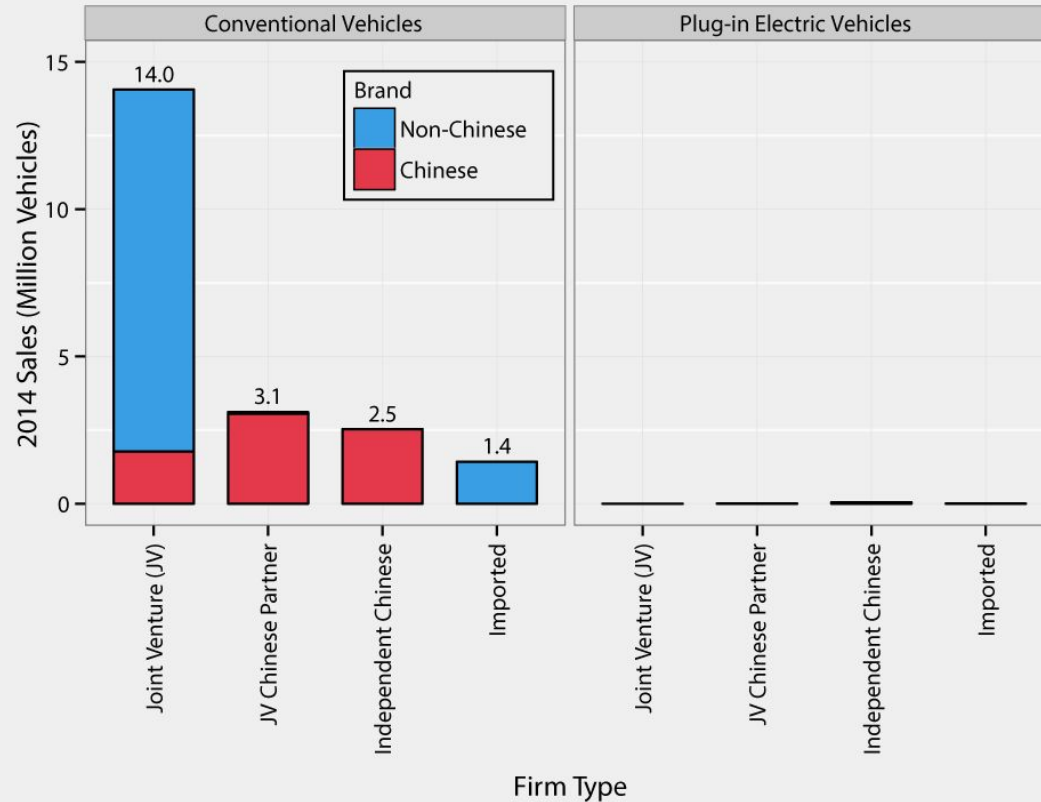
## Archival data

>30 news reports (Automotive News China,  
China Auto Web)  
  
>30 published Chinese papers (historical  
accounts of domestic automotive firms,  
innovation in China)

## 37 in-depth interviews

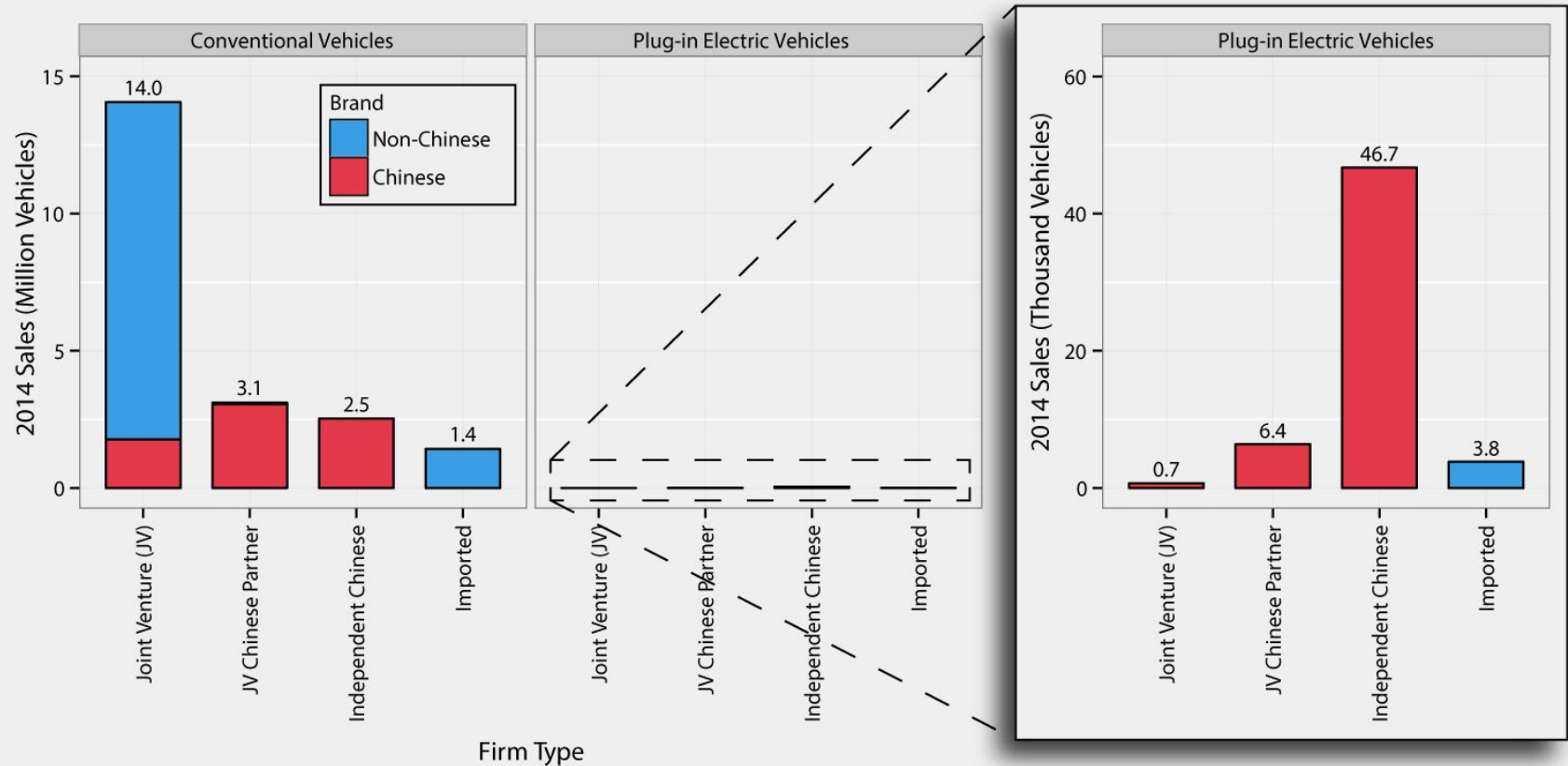
Summers 2014 & 2015  
Automotive managers, engineers, founders  
JV firms, Chery, Haike, Jiayuan, Kandi

# Independent domestic firms are leading China's PEV market

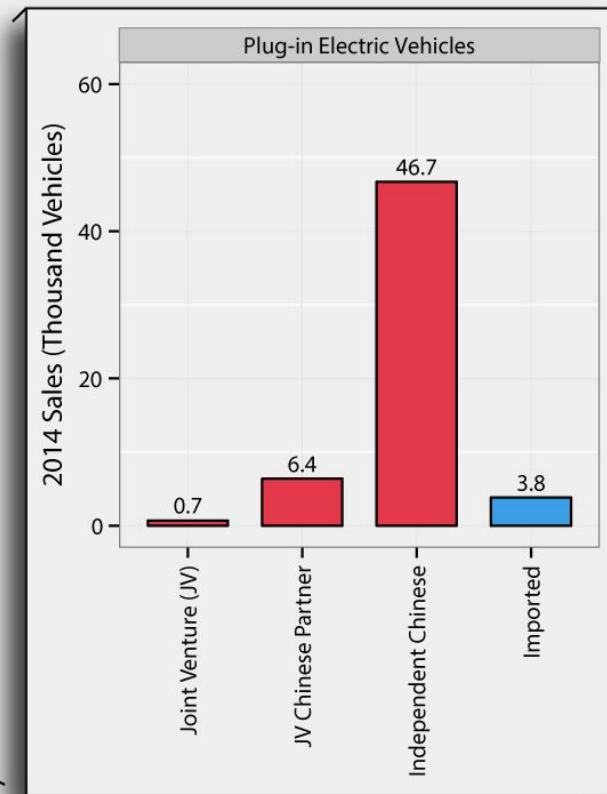
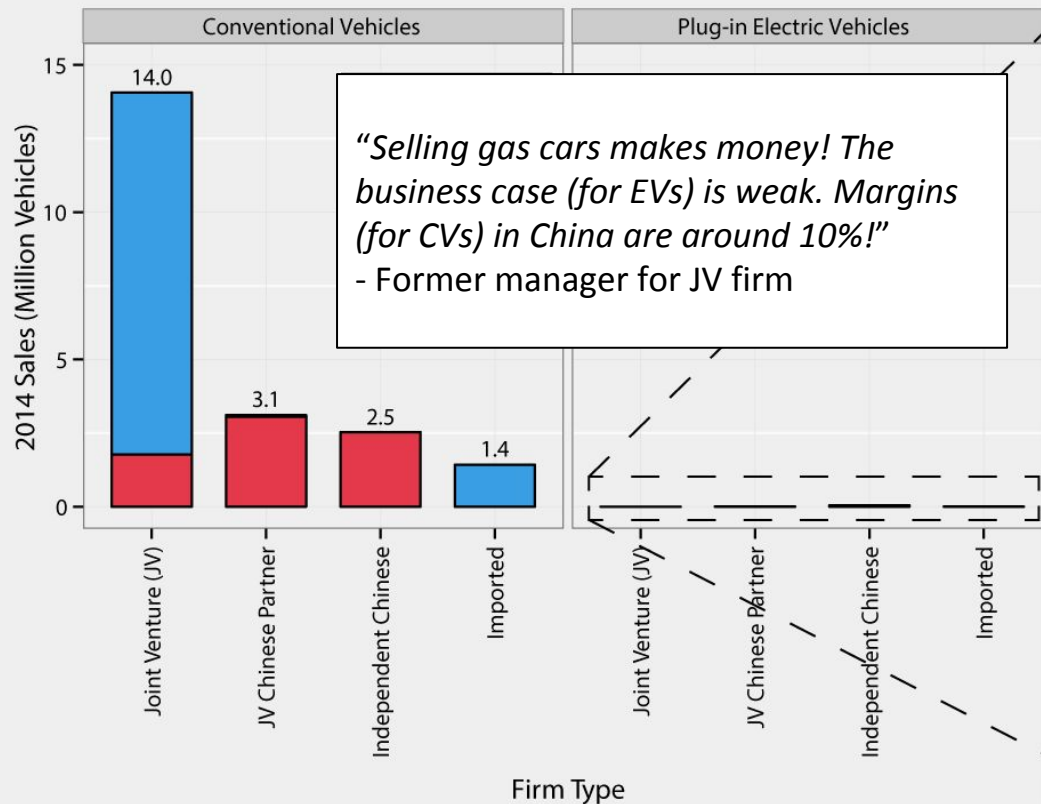




# Independent domestic firms are leading China's PEV market



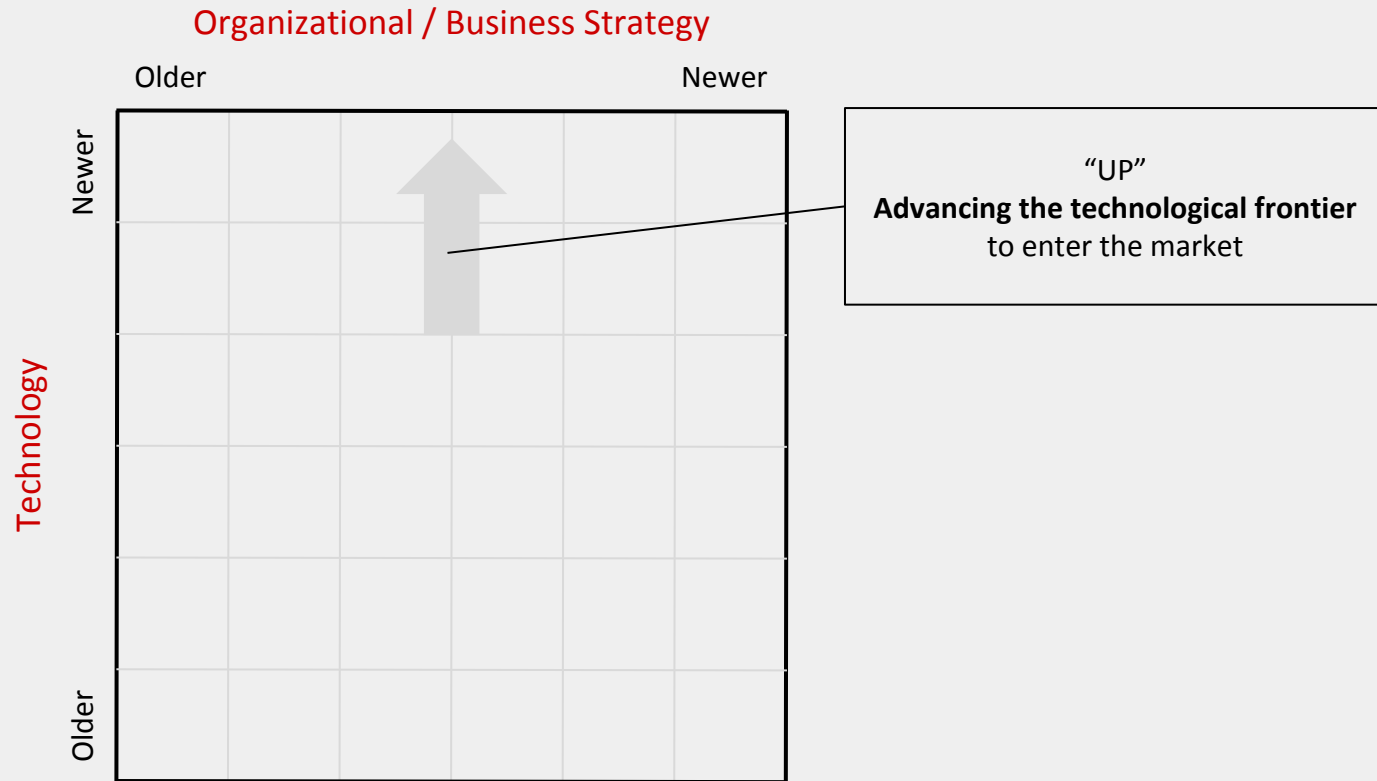
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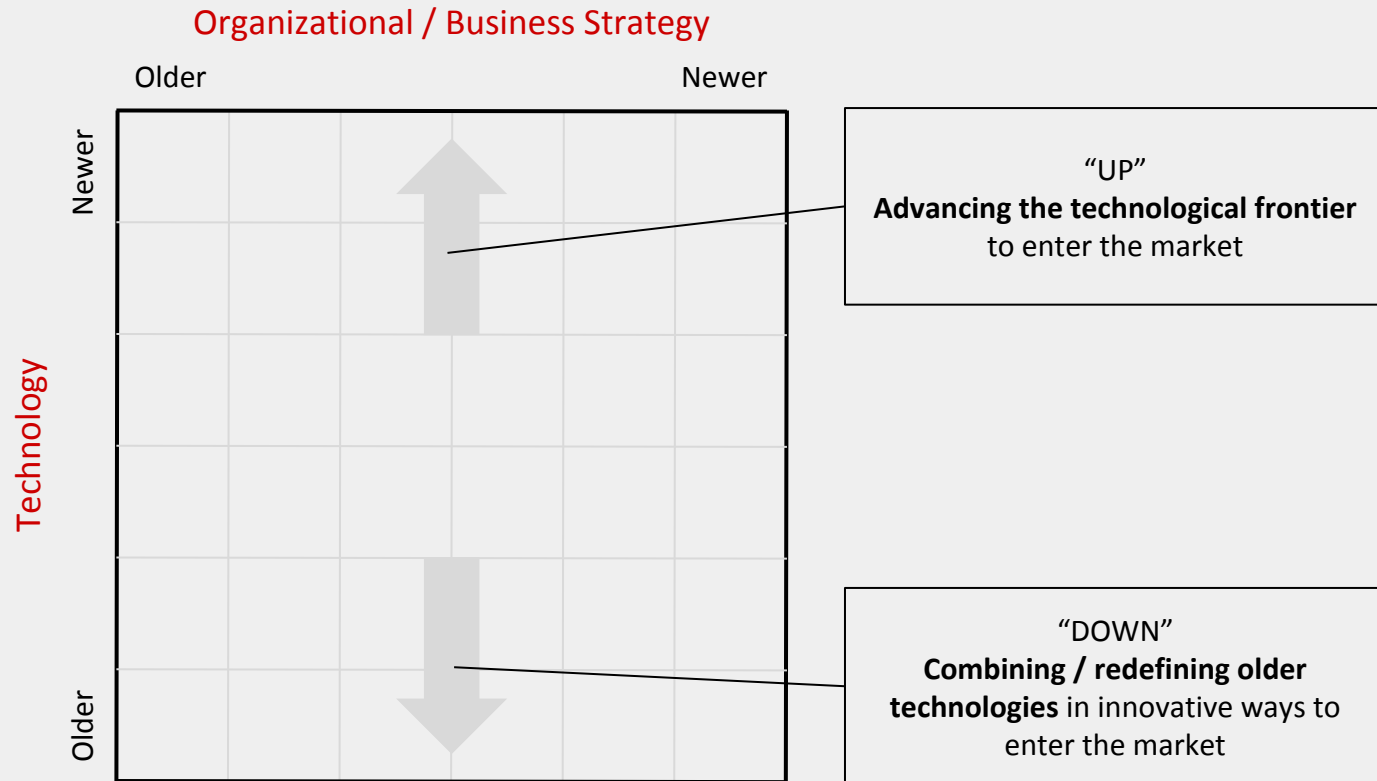
# Innovating Up / Down (Technology) & Sideways (Business Strategy)



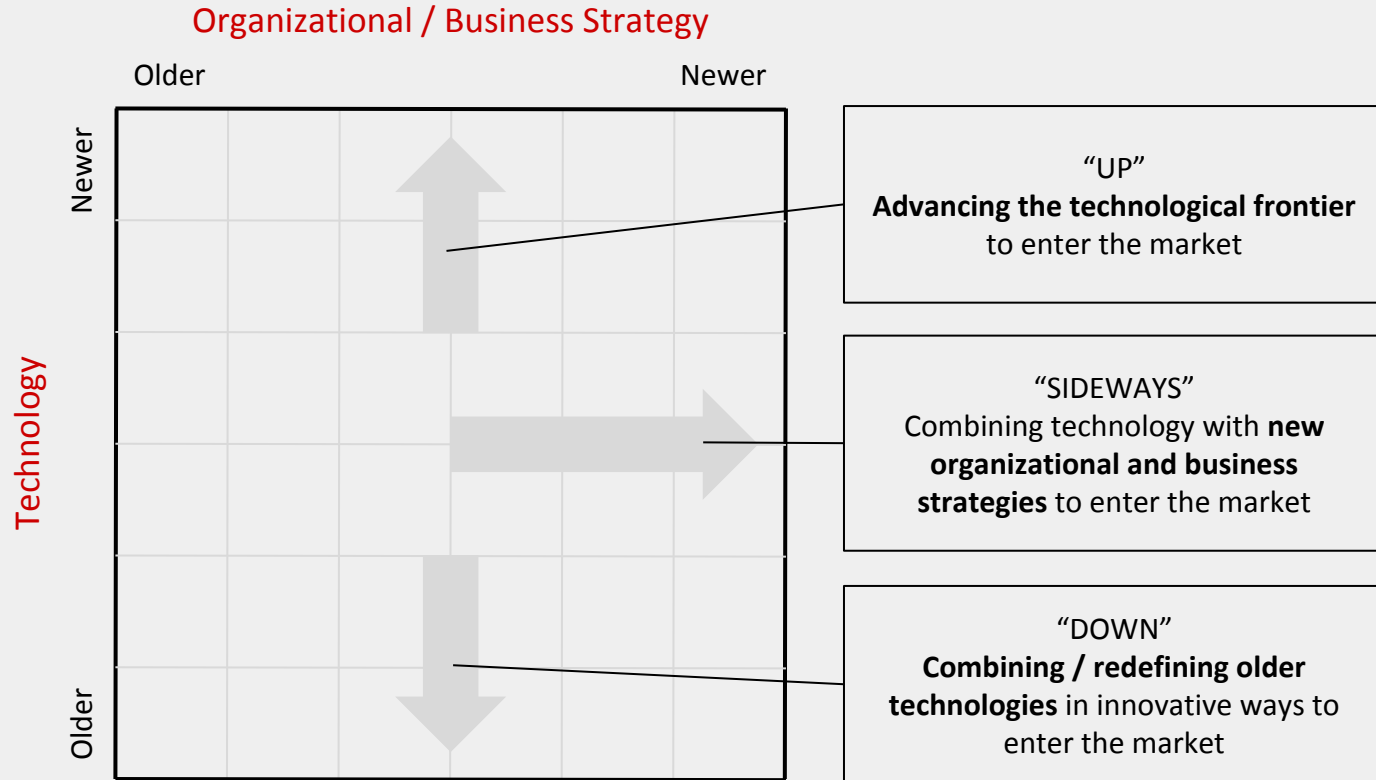
# Innovating Up / Down (Technology) & Sideways (Business Strategy)



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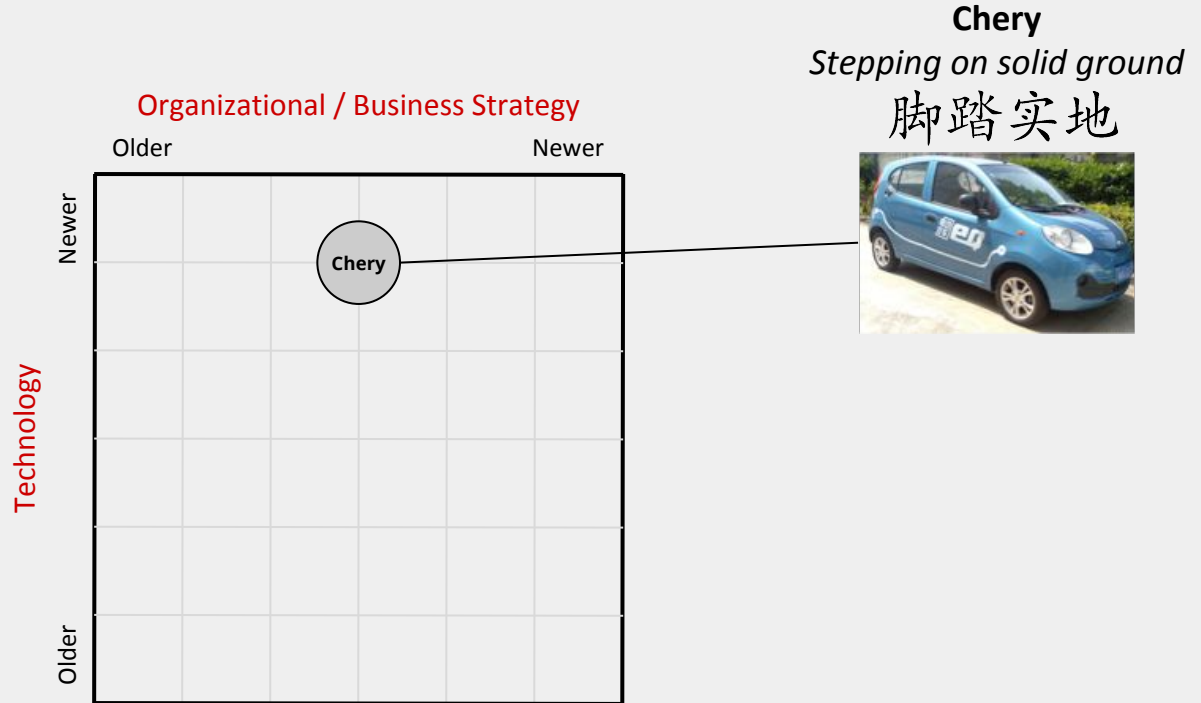
# Innovating Up / Down (Technology) & Sideways (Business Strategy)



# Examples of Innovating Up, Down, and Sideways



# Examples of Innovating Up, Down, and Sideways



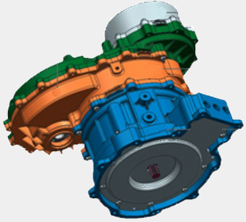


# Examples of Innovating Up, Down, and Sideways

## Haikē

*"Dumbing down is the way up"*

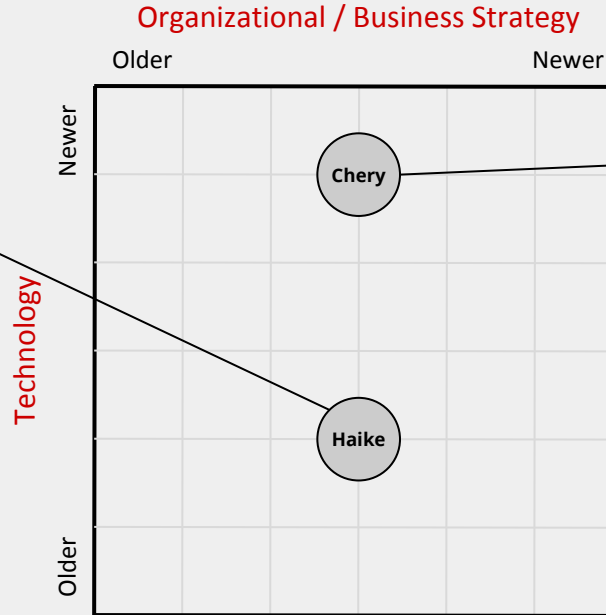
大巧若拙，大道至简



## Chery

*Stepping on solid ground*

脚踏实地

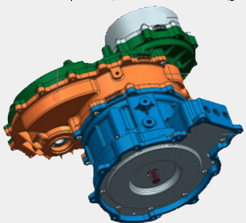


# Examples of Innovating Up, Down, and Sideways

**Haik**

*"Dumbing down is the way up"*

大巧若拙, 大道至简



**Jiayuan**

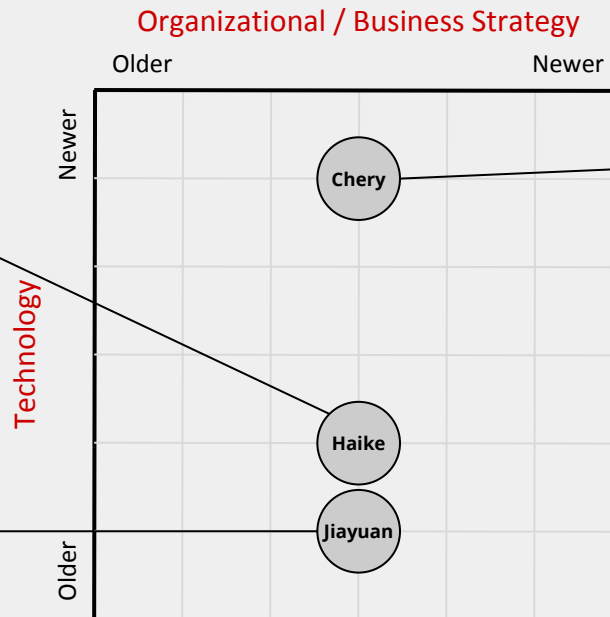
*"If it exists, it must be reasonable"*

存在就是合理的



**Chery**  
*Stepping on solid ground*

脚踏实地

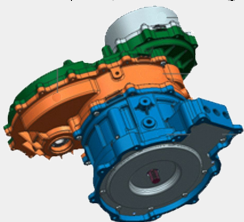


# Examples of Innovating Up, Down, and Sideways

## Haike

*"Dumbing down is the way up"*

大巧若拙，大道至简



## Jiayuan

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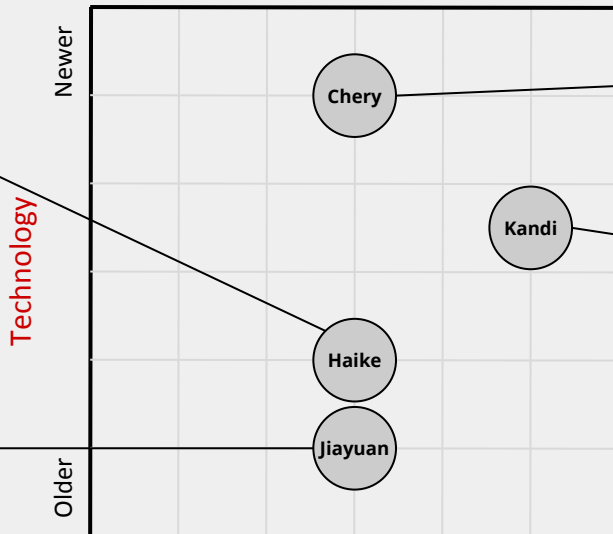
存在就是合理的



Organizational / Business Strategy

Older

Newer



## Chery

*Stepping on solid ground*

脚踏实地



## Kandi

*Different tune, equally melodic*

异曲同工



Existing Theory

My Contribution

# Existing Theory

# My Contribution

*Limiting*  
Innovation

National

*Enabling*  
Innovation

# Existing Theory

# My Contribution

*Limiting*  
Innovation

National

*Enabling*  
Innovation

*Hurting*  
Innovation

Local

*Protecting*  
Innovation

# Existing Theory

# My Contribution

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Innovation

*Hurting*  
Innovation

Local

*Protecting*  
Innovation

*Deepening*

Markets

*Broadening*

# Thanks!

john@cmu.edu  
www.jhelvy.com

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