

Who creates jobs: skewness and the role of age and size in Colombia

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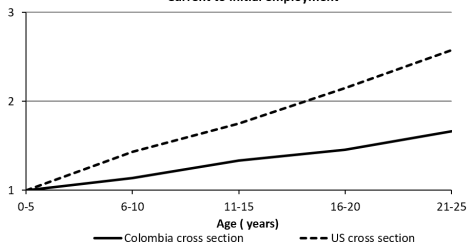
- Growing consensus a crucial characteristic of developing economies vs. the U.S. is that businesses grow, on average, at a slower pace over their life cycle in the former.
- And, that in the U.S. the growth distribution is highly skewed: superstars are crucial. Skewness is particularly marked for young businesses.
- To what extent differences in average life cycle growth spread across the whole distribution of growth? Are developing economies characterized by more dragging low-growth businesses, by a lack of extraordinary-growth businesses, by both?

- **Life cycle growth:** Hsieh and Klenow (2014), Haltiwanger, Jarmin and Miranda (2013), Arkolakis (2018); Foster, Haltiwanger and Syverson (2016).
 - **Distortions that impact allocative efficiency may be behind lower l.c. growth in developing economies:** Hopenhayn and Rogerson (1993), Banerjee and Duflo (2003), Restuccia and Rogerson (2008), Hsieh and Klenow (2009, 2014) and Bartelsman et. al (2013).
- **Growth skewness in the U.S.:** Haltiwanger, Jarmin and Miranda (2013); Decker, Haltiwanger, Jarmin and Miranda (2016).

- **Colombia:** Annual Manufacturing Survey: 1982 to 2012.
 - Longitudinal census of non-micro manufacturing establishments.
 - Plants followed longitudinal for up to 30 years.
 - Potencial bias from the exclusion of micro and the exclusion of good part of informality.
- **United States:** Business Dynamics Statistics.

Life cycle growth

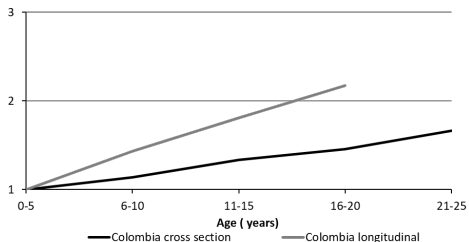
Figure: Employment over the life cycle of manufacturing plants
Colombia vs. the US, 2002-2012
Current to initial employment



- Plants' employment grow over its life cycle.
- Colombian plants grow at a slower pace than U.S. plants.

Life cycle growth

Figure: Employment over the life cycle of manufacturing plants
Colombia, 2002-2012: cross section vs. longitudinal
Current to initial employment

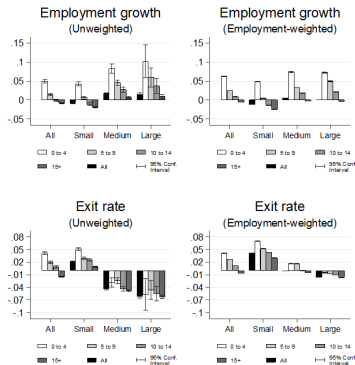


- Plants' employment grow over its life cycle.
- Colombian plants grow at a slower pace than U.S. plants.
- *Actual growth is faster than cross sectional growth.*

Employment growth and exit by age and size

Figure 2: Employment growth rates for continuers and exit rate (1982-2012)

Deviated from mean

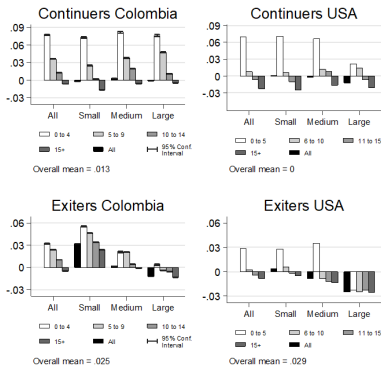


- Net growth falls markedly over life cycle.
- Young plants grow faster than old plants, independent of size.
- Small plants grow slower than medium and large plants.
- Exit rate decrease with age and size.

Colombian plants exhibit up or out dynamics. As result, young plants are drivers of growth.

Employment growth and exit by age and size - Colombia vs. U.S.

Figure 4: Employment growth rates for continuers and exiters
Colombia vs. USA
1992-2012 - Deviated from mean



But the up-or-out dynamics less stark than in the U.S.

- Cross-age differences more marked in U.S. than Colombia
- For Colombia, only plants older than 15 grow under the mean. In U.S. it happens for older than 10 years.
- Selection in the startups is stronger in U.S. than in Colombia.
- Interaction between size and age is stronger in U.S. exit.

Figure 5: Distribution of employment growth rates for continuing establishment by age: Colombia 1982-2012
Employment-weighted

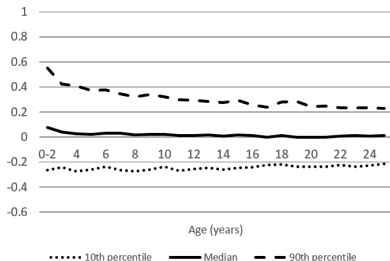
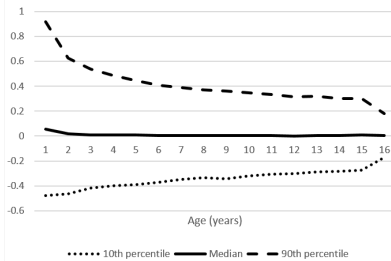


Figure 6: Distribution of employment growth rates for continuing firms by age: U.S. 1992-2011
Employment-weighted



- 10th and 90th percentiles of growth are flatter for Colombian plants compared to U.S.
- Growth is more heterogeneous among young plants.
- Mean and aggregate life cycle growth is driven by the highest percentiles.

Gazelles harder to find in Colombia than in the U.S., especially at young ages.

Contribution to aggregates in the medium run

Table 1: Employment growth in Colombian Manufacturing Establishments: Cohort analysis

Year	<i>Cohort: Establishment's initial year of operation</i>									Total	Pre-1983/Total
	<i>before 1970</i>	<i>1970 to 1977</i>	<i>1978 to 1982</i>	<i>1983 to 1987</i>	<i>1988 to 1992</i>	<i>1993 to 1997</i>	<i>1998 to 2002</i>	<i>2003 to 2007</i>	<i>2008 to 2012</i>		
1982	341690	101672	45661	0	0	0	0	0	0	489023	1.00
1988	289361	95801	56580	38605	2615	0	0	0	0	482962	0.91
1994	342,710	115,044	81,020	73,294	39,095	3,052	0	0	0	654,215	0.82
2000	240,128	85,495	61,695	63,024	43,893	32,858	7,574	0	0	534,667	0.72
2006	232,230	89,288	65,035	80,186	58,675	60,158	32,795	6,861	0	625,228	0.62
2012	218,391	81,244	62,288	81,441	59,929	70,486	53,834	44,854	22,334	694,801	0.52
2012-1994	-124,319	-33,800	-18,732	8,147	20,834	67,434	53,834	44,854	22,334	40,586	

Table 2. Cohort Analysis for US Manufacturing Establishment

Year	Total Employment							Total	Fraction represented by pre-1980 cohort
	<i>Cohort: Establishment's initial year of operation</i>								
	before 1980	1980 to 1984	1985 to 1989	1990 to 1994	1995 to 1999	2001 to 2004	2005		
1990	13,055,792	2,484,685	2,917,997	437,632				18,896,106	0.69
1995	10,957,296	2,186,146	2,532,780	2,213,024	377,085			18,266,331	0.60
2000	9,375,911	1,969,784	2,298,840	1,937,785	2,018,236	430,662		18,031,218	0.52
2005	6,838,438	1,486,619	1,683,964	1,453,381	1,468,927	1,597,354	298,168	14,826,851	0.46
2005-1990	-6,217,354	-998,066	-1,234,033	1,015,749	1,468,927	1,597,354	298,168	-4,069,255	-0.23

Even though the young firms represents a small proportion of the total employment, they contribute the bulk of net employment creation.

Conclusions

- Not surprisingly, U.S. plants grow at a faster pace than Colombian plants.
- Young plants grow faster than old plants in both countries, even after controlling for size differences.
- There is great heterogeneity among the young plants, with high average startups growth driven by superstars; and with a high exit rate.
- The upper tail of high growth is less dynamic in Colombia than in the U.S.
- Young Colombian plants go through less selection than young U.S. plants.
- Young plants contribute the most of employment growth over the medium term.

