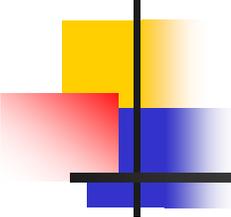


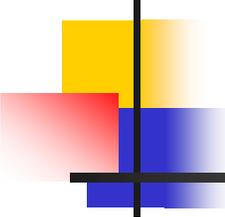
Mexico's Maquiladoras: Border Competitiveness in an Age of Globalization

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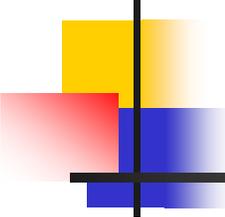
What's a *maquiladora*?

- Production model based on importing materials from anywhere in the world, producing in Mexico, and then exporting end product back to the US.
- Maquilas exist due to availability of low cost Mexican labor
 - Delphi Automotive, TRW, GE, LG Electronics, Emerson Electric, Panasonic, Maytag, Whirlpool, Johnson Controls, Siemens all have plants in Reynosa
- NAFTA changes
 - Ex. - Maquilas can now sell their output in Mexico
- Electronics, auto parts, and apparel primary industry segments



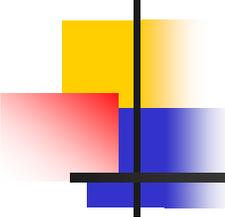
Why am I qualified to talk about them?

- Studying maquilas since 1990
- First fieldwork in 1992
 - First plant: Producer of light bulbs
 - Operator interviews in 1992 and 1993
- Top management interviews, plant tours in Cd. Juárez, Chihuahua, Guadalajara, Monterrey, and Reynosa
- Today's maquiladoras are highly diverse and vary from simple assembly facilities to those using AMT, JIT, TQM, some "third generation" maquilas with design engineering, R&D
 - Delphi's Design Center in Cd. Juárez
 - Schneider Electric in Monterrey



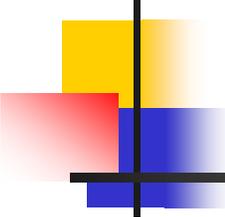
Are *maquilas* a good thing?

- Maquila growth traditionally driven by US based producers closing down and moving to Mexico
- Producers are responding to consumer preferences
 - Are you willing to pay higher prices for goods made in the US?
 - What do you drive? Where was your TV/DVD player, clothes, food, etc. made?
- Not everybody likes offshore production
 - Ex. - New Maytag facility
- Where does this leave US workers?
 - Jobs that can move versus those that can not



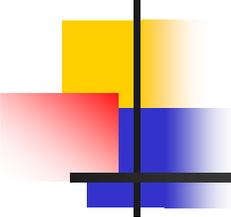
Are *maquilas* a good thing?

- Are maquilas good for Mexican workers?
- Lower level operators
 - Why did you decide to work in a maquila?
 - What kind of jobs have you had in the past?
 - How do those jobs compare with your current job?
 - How does your job compare with the jobs your friends and family have?
 - Do you plan to continue working in the maquilas?
- Conclusion? McDonald's type jobs



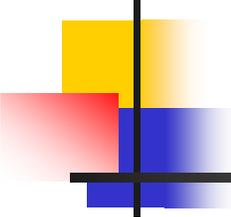
Are *maquilas* a good thing?

- For mid and upper level Mexican nationals?
 - Do US or Mexican nationals have the top jobs?
 - How much do starting engineers make?
 - How much will they make in 10 years if they gain bilingual, bicultural skills?
 - Maquilas responsible for expanding middle class in places like Reynosa, Cd. Juárez
- Maquilas and the environment
 - Ex. - NAFTA and the burned potato in the microwave



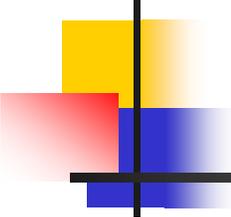
Maquilas in 2005: What to do about China

	<u>2000</u>	<u>2003</u>	<u>2004</u>
■ <i>Total US imports</i>			
■ Mexico	134,734	137,199	154,958
■ China	99,580	151,620	196,159
■ <i>Electrical machinery and equipment</i>			
■ Mexico	44,401	40,274	44,911
■ China	29,361	50,164	73,544
■ <i>Apparel</i>			
■ Mexico	8,617	7,098	6,843
■ China	6,192	8,666	10,684



The Maquiladora Contraction

	<u>10/2000</u>	<u>12/2003</u>	<u>12/2004</u>
■ Cd. Juárez	264,241	196,979	206,327
■ Tijuana	199,428	141,659	159,206
■ Reynosa	67,275	73,131	81,542
■ Matamoros	69,989	52,445	52,777
■ Mexicali	65,494	48,602	55,950
■ Electronics	467,508	330,799	348,159
■ Auto parts	250,635	239,164	249,882
■ Apparel	293,576	195,787	201,766



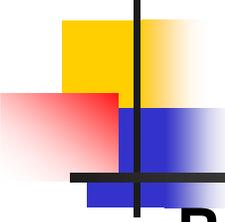
Given lower costs in China, why do multinational firms continue to produce in Mexico?

- **Research methodology**

- Semi-structured interviews with plant managers during 2002, 2003
- Sample
 - 50 maquilas in Reynosa (46,749 employees)
 - 5 PITEK firms in Guadalajara (20,335 employees)

- **Reynosa results**

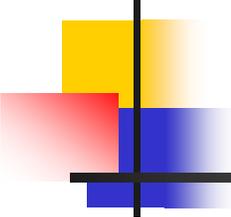
- Maquilas competing in global markets
 - **Standardized product, low cost producers (8 firms, 3,972 employees). These firms largely unsuccessful.**



With higher costs, why do MNCs continue to produce in Mexico?

- **Reynosa results**

- Maquilas competing in mixed global/regional markets
 - **Corporate shelters (8 firms, 8,733 employees)**
 - **Dual sourcing (5 firms, 4,100 employees)**
 - **Mass customization (5 firms, 2,998 employees)**
- Maquilas competing in regional markets
 - **Just-in-time (JIT) producers (6 firms, 16,623 employees)**
 - **Zero defect producers (4 firms, 2,440 employees)**
 - **Low value to weight producers (3 firms, 2,310 employees)**
 - **Remanufacturing centers (2 firms, 2,225 employees)**



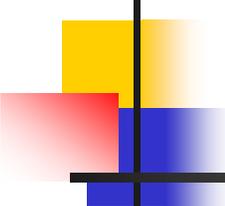
With higher costs, why do MNCs continue to produce in Mexico?

- **Reynosa results**

- **Third generation maquiladoras**
 - **Maquila with largest design center transferred that function to the home country**
 - **Maquila with highest percentage of engineers closed**
 - **Some evidence for secondary design centers (used to increase speed of new product introduction)**

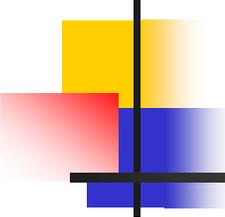
- **Guadalajara results**

- **High-tech contract manufacturers**
 - **Experience significant job losses**
 - **Switched from “low mix, high volume” to “high mix, low volume” strategy**
 - **From global to mix global/regional and regional strategies**



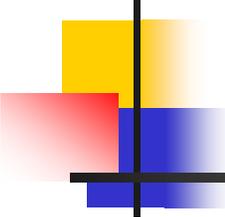
The latest study . . .

- More on how Mexico can compete when facing Chinese competition
- Darwinian perspective of maquila dynamics
- Sample: 11 Reynosa based maquilas established since 2002
 - The technology hypothesis
 - The proximity hypothesis
- Findings
 - Proximity advantages high, technology/capital intensity of startup maquilas ranges from low to high
 - The “order fulfillment” maquila



New ideas about how to compete

- The only constant is change . . . Or how to get \$40 million from the state of Texas
- Proposal for the Center for Rapid Response Manufacturing
 - JV between UTPA, local community college, and industry
 - Takes 4 to 6 weeks to ship products by boat from China to US
 - What if we could go from product idea to mass production in 4 weeks?



New ideas about how to compete

- Let's rethink logistics
 - Products from Asia landed in port of Long Beach, Los Angeles, goes to Reynosa, then to distribution centers in US
 - West coast dock workers strike, US security, and do you believe how much dock workers make
- The new plan
 - Land Asian products in Mexican ports, ship to Reynosa, then use McAllen as your US distribution center (centrally located between population centers on East and West coasts, consolidate partial loads, etc.)