

The Wood Household Furniture and Kitchen Cabinet Industries: A Contrast in Fortune

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Abstract

In 1977, the value of wood household furniture shipments from domestic manufacturers exceeded kitchen cabinet shipments by 170 percent; conversely, in 2006, shipments of cabinets exceeded shipments of furniture by 78 percent. The most apparent reason for the decrease in domestic furniture shipments is the increase in furniture imports, whereas cabinet demand has increased because of the popularity of larger kitchens and the robust housing market prior to 2006. However, there also are less apparent factors. A large portion of domestically produced wood furniture is sold to consumers from retail stores whose buyers ordered product at semiannual furniture markets. Meanwhile, a growing volume of cabinets are designed and ordered by consumers at home improvement centers. Furniture manufacturers carry large volumes of finished products in inventory, while cabinet manufacturers carry low inventories. Furniture has become a quasi commodity that is priced within narrow ranges depending on quality, whereas sale methods for semicustom and custom cabinets allow consumers to order the species, finishes, and features they want. The price competitiveness of the furniture industry has allowed imports to become the major source of product. The need to price furniture at levels competitive with imports has also resulted in a greater use of composite materials versus lumber and dimension stock. By contrast, kitchen cabinet manufacturers are using greater volumes of lumber and dimension. While these factors have resulted in a contrast in fortune for the wood household furniture and cabinet industries in the United States, possible opportunities exist for the reemergence of parts of the domestic furniture industry.

In 1977, the deflated value of product shipments (shipments) of wood household furniture (wood furniture) by domestic manufacturers exceeded those of wood kitchen cabinets¹ (cabinets) by 170 percent (Table 1). As the decades progressed, the value of domestic wood furniture shipments fluctuated while shipments of cabinets trended upward. In 2002, shipments of cabinets were nearly identical to the shipments of wood furniture (Fig. 1). Shipments of cabinets continued to increase over the next 4 years while wood furniture shipments decreased; by 2006, shipments of cabinets exceeded shipments of wood furniture by 78 percent. This change elevated cabinet producers from being a relatively minor consumer of hardwood lumber in

1977 to being the largest user of graded hardwood lumber by 2002 (Luppold and Bumgardner 2008).

The most apparent reason for decreased domestic wood furniture shipments is the 71 percent increase in wood furniture imports since 2001 (Cochran 2008). By contrast, cabinet demand has increased with new home construction and an increase in kitchen remodeling. However, even when accounting for imports, consumption (value of product shipments plus net imports) of kitchen cabinets (including countertops) exceeded consumption of wood household furniture by 2006 (Fig. 2), demonstrating the robust demand for cabinet products. In addition, other less apparent factors related to the manufacturing and distribution processes of these products also have contributed to the changes in their respective fortunes. The objectives of this article are to

¹ Prior to 1997, wood household furniture manufacturers were classified under SIC 2511 and kitchen cabinet manufacturers under SIC 2434. In 1997 and subsequent years, wood household furniture manufacturers were classified under NAICS 337122 and kitchen cabinet manufacturers under NAICS 337110. The current kitchen cabinet classification includes countertops. In an effort to be historically consistent, the countertop portion of the value of product shipment has been deducted from total value shipments in Table 1 and Figure 1.

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Table 1.—Value of product shipments^a for the wood household furniture and kitchen cabinet (excluding countertops) industries and volume of lumber consumed by these industries in 1977, 1982, 1987, 1992, 1997, and 2002.

Year	Value of product shipments (millions of 1982 dollars) ^b		Volume of hardwood lumber consumed (millions of board feet) ^c	
	Wood household	Kitchen cabinets	Wood household	Kitchen cabinets
1977	5,816 ^d	2,245 ^e	1,783	288
1982	4,846 ^f	2,001 ^g	1,613	312
1987	6,360 ^h	3,844 ⁱ	1,781	550
1992	5,750 ^j	3,698 ^k	1,546	898
1997	6,409 ^l	4,086 ^m	1,592	1,266
2002	5,754 ^l	6,019 ^m	1,248	1,367

^a Value of product shipments is the total value of product that is manufactured and shipped by a firm and differs from value of shipments, which can include resales of purchased product or repair work.

^b US Department of Labor, Bureau of Labor Statistics (2008; series WPU1212 for furniture and series WPU08210101 for cabinets).

^c Luppold and Bumgardner (2008).

^d US Department of Commerce (USDC), Bureau of the Census (1980b).

^e USDC, Bureau of the Census (1980a).

^f USDC, Bureau of the Census (1985b).

^g USDC, Bureau of the Census (1985a).

^h USDC, Bureau of the Census (1990b).

ⁱ USDC, Bureau of the Census (1990a).

^j USDC, Bureau of the Census (1995b).

^k USDC, Bureau of the Census (1995a).

^l USDC, US Census Bureau (2004b).

^m USDC, US Census Bureau (2004a).

examine the US wood furniture and cabinet industries from 1977 to the current decade with respect to production and marketing processes and business inventories and to discuss how these factors have interacted to influence wood-based material consumption.

Two Similar but Different Industries

While wood furniture and cabinets are made from comparable materials using similar equipment, the histories, manufacturing facilities, and manufacturing methods associated with these two products are different. Evidence of wooden tables and chairs can be traced back over 6,000 years to Egypt (Bridgwater and Kurtz 1963), and chests of drawers can be traced back to the middle 17th century (Blackburn 2008). By contrast, the first product expressly designed to store food and kitchen equipment was the Hoosier cabinet, initially manufactured in 1903 (Kitchen Cabinet Manufacturers Association [KCMA] 2005). The first-wall mounted kitchen cabinet associated with modern kitchens was constructed in the early 1920s (KCMA 2005).

The relative age of wood furniture and cabinets as products and the different growth rates in the value of shipments of these products have influenced the relative age and design of manufacturing facilities. Although some US wood furniture plants were built in the past 20 years, most of the wood furniture plants in the eastern United States were built before 1970. In general, wood furniture manufacturing facilities in the eastern United States are (or were) highly integrated with drying operations, rough mills, plywood plants, and assembly operations located in one facility, in a cluster of facilities at one site, or at several facilities at multiple sites. Some wood furniture operations also own

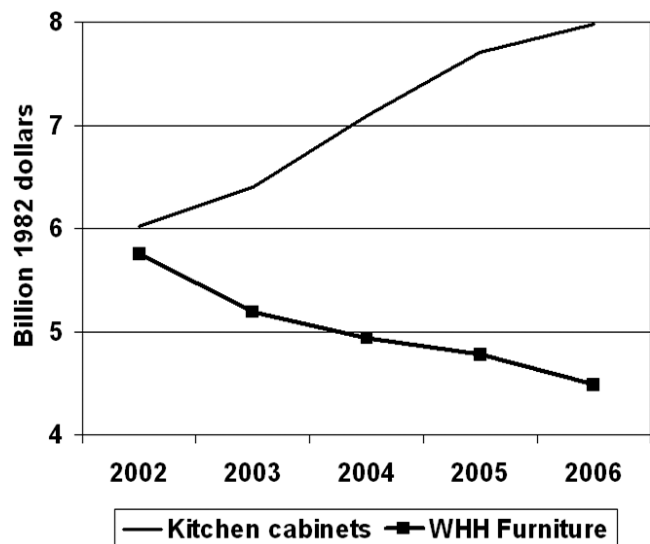


Figure 1.—Value of product shipments of wood household furniture versus kitchen cabinets (excluding countertops) by domestic manufacturers from 2002 to 2006 in constant 1982 dollars (US Department of Labor, Bureau of Labor Statistics 2008; series WPU1212 for furniture and WPU08210101 for cabinets). Data are from the US Department of Commerce (USDC), US Census Bureau (2006a [for 2002, 2003, and 2004], 2008a [for 2005 and 2006]).

particleboard or other panel product manufacturing facilities.

Before World War II, most wood kitchen cabinets were produced in local shops. Although larger cabinet facilities serving regional markets were built in the 1950s, most of the plants in operation today were built after 1970. Cabinet plants that manufacture lower-cost stock cabinets can be similar to large wood furniture plants in that they purchase green lumber and fabricate cabinets in one facility or in a system of facilities. Unlike larger wood furniture operations, however, large cabinet manufacturers purchase most of their plywood and other panel products from outside sources. Stock cabinet plants that produce multiple product lines also tend to batch production orders into lots that can be produced in a week or less (A. Raymond, A.G. Raymond and Company, Raleigh, North Carolina, personal communication, 2009).

Plants that manufacture semicustom and custom cabinets tend to be less integrated and purchase higher volumes of kiln-dried lumber and dimension stock (lumber that is fabricated into a rough or finished cabinet or furniture part) from outside sources. In general, the more species of lumber that a cabinet plant processes, the greater the volume of dimension purchased from wood component manufacturers. The wood component industry has developed just-in-time production and delivery processes to meet the demands of cabinet manufacturers (A. Raymond, personal communication, 2009).

Growth in demand has allowed the US cabinet industry to invest in plants and equipment to produce smaller lots, and new capital expenditure has increased in recent years (Fig. 3). By contrast, as imports became an important part of the product line for many domestic wood furniture companies in the 1990s, capital investment decreased (Fig. 3). This meant

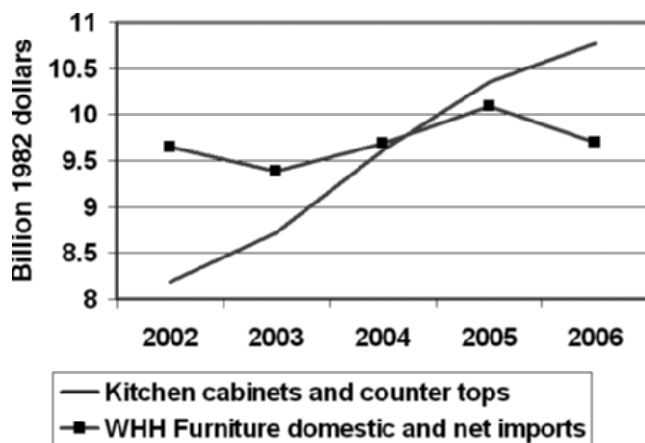


Figure 2.—Value of product shipments plus net imports of wood household furniture and kitchen cabinets (including counter-tops) from 2002 to 2006 in constant 1982 dollars (US Department of Labor, Bureau of Labor Statistics 2008; series WPU1212 for furniture and WPU08210101 for cabinets). Data are from the US Department of Commerce (USDC), US Census Bureau (2006a [for 2002, 2003, and 2004], 2008a [for 2005 and 2006]); USDC International Trade Administration (n.d. [for all years]).

that the computer numerically controlled equipment needed to produce smaller lots of product were purchased by cabinet manufacturers but were not purchased by wood furniture producers (A. Raymond, personal communication, 2009).

In some respects, wood furniture has become a commodity in that it is priced within narrow ranges (price points) depending on the level of quality. Although a small but growing amount of wood furniture is custom made to buyer specification, as exemplified by the custom portion of the Amish furniture industry (Bumgardner et al. 2007), a large volume of wood furniture is sold through the major furniture markets in High Point, North Carolina, and Las Vegas.² At these markets, furniture prototypes are shown to retailers and wholesalers who then order the suites or pieces they think will appeal to their customers. Sometimes domestic wood furniture manufacturers have a limited volume of product already manufactured, but in recent years most of the wood furniture has been manufactured after it has been ordered. However, because most of the wood household furniture is sold in suites, wood furniture manufacturers have to warehouse portions of these suites until all pieces are built.

The marketing process for kitchen cabinets has evolved over time. Before World War II, most cabinets were purchased by the home builder or the home owner. In the 1950s, the concept of stock cabinets emerged. These cabinets are built using standardized-width dimensions in 3-inch increments. Normally stock cabinets featured one species and one finish. The emergence of the stock cabinet allowed manufacturers to build and warehouse cabinets, resulting in much quicker delivery. Initially the points of sale for stock cabinets for home owners were small shops that would install the cabinets and fabricate and install

² While many domestic and offshore manufacturers sell their products at one or more furniture markets, furniture can be sold directly to customers at company controlled stores or purchased directly by mass marketers.

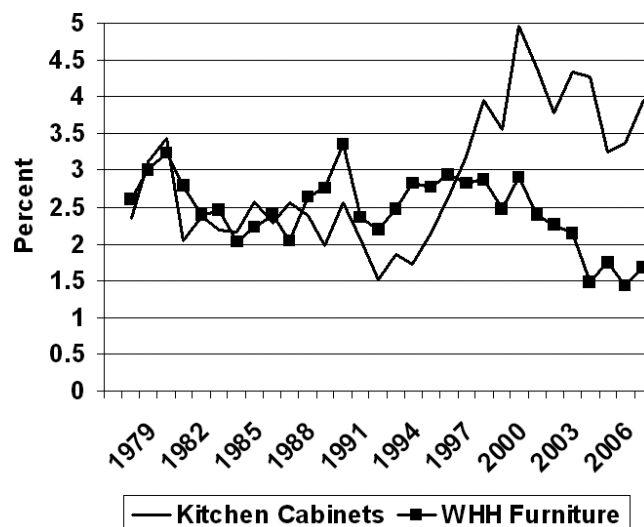


Figure 3.—New capital expenditures by the wood household furniture and kitchen cabinet and countertop industries as a percentage of value of product shipments from 1977 to 2006. Data are from the US Department of Commerce (USDC), Bureau of the Census (1995b [for 1977 to 1992], 1995a [for 1977 to 1992], 1998 [for 1993 to 1996]); USDC US Census Bureau (2004b [for 1997 to 2002], 2004a [for 1997 to 2002], 2006b [for 2003 and 2004], 2008b [for 2005 and 2006]).

countertops. Small contractors also could purchase stock cabinets at these shops, but large contractors could buy directly from manufacturers or through a wholesaler.

The distribution of cabinets began to change after 1979 when Home Depot started to redefine traditional construction supply yards into home improvement centers (KCMA 2005). Initially these centers carried a few lines of stock cabinets and later provided displays of stock cabinets with a limited number of options. Today, home improvement stores carry one or two lines of stock cabinets and several displays of semicustom cabinets. Manufacturers of semicustom cabinets offer numerous styles and species in a multitude of finishes. In addition, the consumer can select upgrades in box construction ranging from plastic covered particleboard to $\frac{1}{8}$ -inch hardwood plywood. Orders for these cabinets go directly to the manufacturer, and the finished product is delivered to the home owner or contractor. Cabinets also have a financial advantage over wood furniture because the cost of cabinets in new homes can be included in the mortgage.

Changes in Business Inventories

An examination of business inventories provides useful information on how fast working capital moves through the production processes and where inventories tend to build up in the process (Cumbo et al. 2006). Older industrial models specify high output machinery to reduce cost, and large volumes of inventory act as a buffer in the event of a shortage or a disruption in the manufacturing process. Modern industrial models including just-in-time and lean manufacturing attempt to minimize the volume of materials and products held on-site in an effort to minimize the interest costs of holding such capital. Modern industrial models also allow for more flexibility in manufacturing processes because specific material can be obtained to

Table 2.—Total inventory, inventory of finished goods, value of work in progress, and inventory of materials and supplies as a percentage of total shipments for the wood household furniture and kitchen cabinet and countertop industries, 1977, 1982, 1987, 1992, 1997, and 2002.

Year	Industry	Percentage of total shipments			
		Total business inventories	Finished goods	Work in progress	Materials and supplies
1977 ^a	Wood household	19.8	7.9	4.7	7.3
1977 ^b	Kitchen cabinets	13.3	3.3	3.3	6.7
1982 ^c	Wood household	23.0	10.8	5.3	6.9
1982 ^d	Kitchen cabinets	13.9	3.2	3.1	7.7
1987 ^e	Wood household	19.4	8.7	4.4	6.3
1987 ^f	Kitchen cabinets	10.2	2.1	2.7	5.9
1992 ^g	Wood household	20.4	9.9	4.2	6.3
1992 ^h	Kitchen cabinets	9.9	1.9	2.7	5.3
1997 ⁱ	Wood household	19.1	9.1	3.8	6.2
1997 ^j	Kitchen cabinets	9.4	2.3	2.3	4.8
2002 ⁱ	Wood household	17.0	9.2	3.0	4.8
2002 ^j	Kitchen cabinets	6.8	1.5	1.8	3.5

^a US Department of Commerce (USDC), Bureau of the Census (1980b).

^b USDC, Bureau of the Census (1980a).

^c USDC, Bureau of the Census (1985b).

^d USDC, Bureau of the Census (1985a).

^e USDC, Bureau of the Census (1990b).

^f USDC, Bureau of the Census (1990a).

^g USDC, Bureau of the Census (1995b).

^h USDC, Bureau of the Census (1995a).

ⁱ USDC, US Census Bureau (2004b).

^j USDC, US Census Bureau (2004a).

service a specific order. In the case of custom and semicustom cabinets, advance inventories of finished product are not held in inventory.

In 1977, business inventories held by wood furniture manufacturers were equivalent to nearly 20 percent of the value of shipments, while inventories held by cabinet producers represented 13 percent of the value of shipments (Table 2). Forty percent of the business inventories held by wood furniture manufacturers were finished goods, compared to 25 percent for cabinet manufacturers. The relatively large volume of finished goods held by wood furniture manufacturers reflects the tendency of these manufacturers to warehouse incomplete suites. Wood furniture manufacturers have been slow to adopt lean manufacturing (Lihra et al. 2008) even though these techniques have been implemented by upholstered furniture manufacturers (Hunter et al. 2004).

Between 1977 and 2002, business inventories held by wood furniture manufacturers relative to the value of shipments declined by approximately 15 percent (Tables 1 and 2). The decline in inventories by wood furniture manufacturers resulted from reductions in work in progress and in materials and supplies. However, finished wood furniture held in inventory in 2002 was equivalent to 9.2 percent of the value of shipments, an increase over 1977 levels but an improvement over 1982 (a recession year) levels. Inventories held by cabinet manufacturers relative to the value of shipments declined by nearly 50 percent between 1977 and 2002 (Tables 1 and 2). The decline occurred in all categories (finished goods, work in progress, and material and supplies) by a similar amount. This decline occurred as the production of semicustom cabinets increased relative to stock cabinets and because of the batching of stock cabinet production in smaller lots.

Changes in Shipments of Resale Products

Wood furniture and cabinet manufacturers may purchase finished products from other manufacturers to provide a more robust line of products or to reduce costs. In 1977, these products for wood furniture producers could have included such items as imported wooden chairs (a labor-intensive product). In addition to resales, some wood furniture manufacturers import wood furniture parts and assemble these parts into a finished product. The importation of parts has increased in a similar fashion as wood furniture imports. Cabinet producers with limited milling capacity also could purchase specialty items such as pantries. However, the value of resale products sold by cabinet manufacturers was small relative to wood furniture manufacturers (Table 3).

Since 1977, the ratio of resale product to value of shipments has increased by 170 percent for wood furniture manufacturers versus 70 percent for cabinet manufacturers (Table 3). The large increase in reshipments of wood furniture by domestic manufacturers is indicative of the outsourcing of more labor-intensive parts of furniture suites (such as chairs and mirrors) to China or other countries. Cabinet producers also can outsource and purchase millwork products such as columns and moldings, which allow consumers to accessorize their kitchens.

Consumption of Wood-Based Material

The most important wood-based product consumed by the US wood furniture and cabinet industries on a value basis is hardwood lumber (Fig. 4). In 2002, the value of lumber purchased by the cabinet industry exceeded the value of lumber purchased by the wood furniture industry because cabinet producers consumed more lumber, and the lumber purchased was on average of a greater value. Hardwood dimension stock was the second most important wood

Table 3.—Value of shipments, resales of purchased merchandise, and ratio of value of shipments to resales for wood household furniture and kitchen cabinets and countertops, 1977, 1982, 1987, 1992, 1997, and 2002.

Year	Wood household furniture			Kitchen cabinets		
	Millions of 1982 dollars		% ratio of shipments to resales	Millions of 1982 dollars		% ratio of shipments to resales
	Value of shipments	Resales		Value of shipments	Resales	
1977 ^a	4,948 ^a	198 ^a	3.3	2,378 ^b	45 ^b	1.9
1982 ^b	5,057 ^c	141 ^c	2.8	2,061 ^d	25 ^d	1.2
1987 ^c	7,274 ^e	340 ^e	4.7	2,129 ^f	48 ^f	2.2
1992 ^d	6,762 ^g	351 ^g	5.2	3,557 ^h	70 ^h	2.0
1997 ^e	7,312 ⁱ	439 ⁱ	6.0	7,002 ^j	152 ^j	2.5
2002 ^e	7,499 ⁱ	665 ⁱ	8.9	7,958 ^j	204 ^j	2.6

^a US Department of Commerce (USDC), Bureau of the Census (1980b).

^b USDC, Bureau of the Census (1980a).

^c USDC, Bureau of the Census (1985b).

^d USDC, Bureau of the Census (1985a).

^e USDC, Bureau of the Census (1990b).

^f USDC, Bureau of the Census (1990a).

^g USDC, Bureau of the Census (1995b).

^h USDC, Bureau of the Census (1995a).

ⁱ USDC, US Census Bureau (2004b).

^j USDC, US Census Bureau (2004a).

product purchased by the cabinet industry in 2002; composite products were the second most important wood product purchased by the wood furniture industry. There are multiple reasons for this difference. Cabinet manufacturers have a greater tendency to purchase dimension in an effort to meet quicker production schedules, and the composite products used in cabinet manufacturing are ¼- to ½-inch material used primarily in box construction. Wood furniture manufacturers consume larger volumes of ½- and ⅝-inch panel products, which in the case of particleboard are covered by veneer, plastic, or foil wrap or in the case of medium-density fiberboard (MDF) are milled as if lumber.

Veneer and plywood purchases by wood furniture and cabinet manufacturers also differ. While wood furniture manufacturers purchased similar dollar values of hardwood veneer and plywood in 2002, cabinet manufacturers purchased nearly three times more plywood than veneer. Again this difference is largely the result of the more streamlined production process used in cabinet production versus wood furniture production.

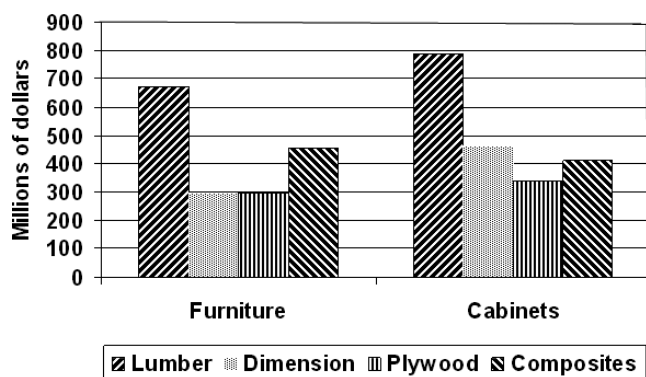


Figure 4.—Dollar value of lumber, dimension, plywood, and composite products purchased by the wood household furniture and kitchen cabinet and countertop industries in 2002. Data are from the US Department of Commerce, US Census Bureau (2004a, 2004b).

Another difference between the wood furniture and cabinet industries since 1982 can be demonstrated by examining the proportion of dollars spent on the three major wood product groups: solid (dimension and lumber), plywood (including veneer), and composite (particleboard, MDF, and hardboard). Between 1982 and 2002, the relative value of solid wood products purchased by wood furniture manufacturers declined, while the relative value of composite products increased (Fig. 5). These changes appear to be related to an effort by domestic wood furniture manufacturers to compete with imported wood furniture by reducing material costs. By contrast, the value of solid wood products purchased by cabinet manufacturers has increased, while the relative value of composite products has decreased (Fig 6). These changes appear to be related to increased production of semicustom cabinets that require cabinet manufacturers to purchase greater volumes of kiln-dried lumber, dressed lumber, and hardwood dimension.

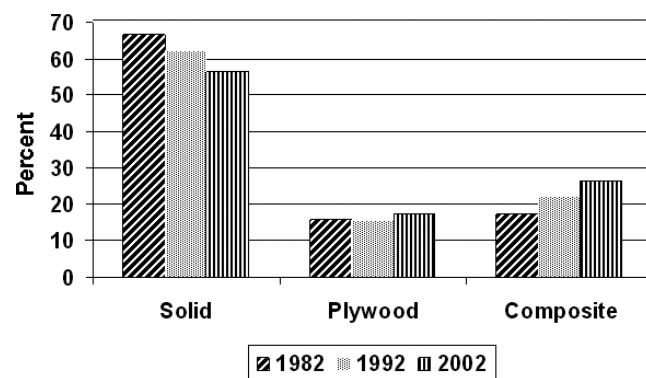


Figure 5.—Proportion of dollar value of wood based materials purchased by the wood household furniture industry in the form of solid wood (dimension and lumber), plywood, and composite wood products in 1982, 1992, and 2002. Data are from the US Department of Commerce (USDC), Bureau of the Census (1985b, 1995b); USDC, US Census Bureau (2004b).

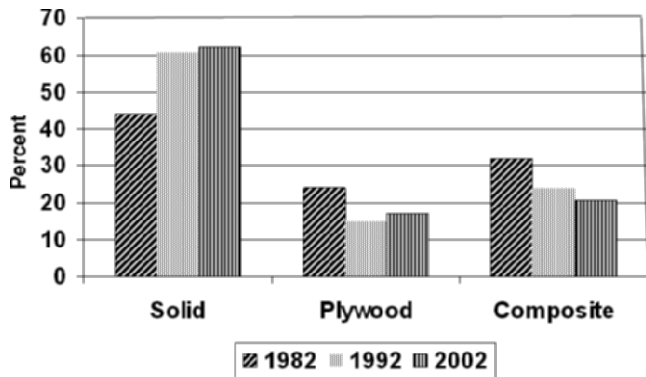


Figure 6.—Proportion of dollar value of wood based materials purchased by the kitchen cabinet and countertop industry in the form of solid wood (dimension and lumber), plywood, and composite wood products in 1982, 1992, and 2002. Data are from the US Department of Commerce (USDC), Bureau of the Census (1985a, 1995a); USDC, US Census Bureau (2004a).

Conclusion

In 1977, the value of wood furniture shipments by domestic manufacturers exceeded cabinet shipments by 170 percent, but by 2006 shipments of cabinets exceeded shipments of wood furniture by 78 percent. This change is surprising given that wood furniture and cabinets are made from comparable materials using similar production procedures. The most apparent reason for the decrease in domestic wood furniture shipments is the dramatic increase in wood furniture imports since 1999, while cabinet demand has increased because of new home construction and an increase in kitchen remodeling. However, less apparent factors are involved with the distribution and manufacturing processes associated with these industries that also have contributed to the changes in their respective fortunes.

Wood furniture has been produced in some form for thousands of years; the modern kitchen cabinet is less than a century old. Wood furniture is sold to consumers primarily from stores, which first order the products from manufacturers through wood furniture markets, while growing volumes of cabinets are directly ordered by consumers at home improvement centers. Wood furniture manufacturers carry large volumes of finished product so that complete suites of wood furniture are available to retailers, and they also carry relatively large inventories as work in progress and material and supplies. In 2002, cabinet producers carried 60 percent less business inventories than wood furniture manufacturers and 84 percent less finished goods in inventories. Because of differences in the manufacturing and distribution processes, wood furniture has become a commodity that is priced within narrow ranges depending on quality, while semicustom and custom cabinets allow consumers to order the species, finishes, and features they prefer.

The price competitiveness of the wood furniture industry has allowed imports to become the major source of product available to consumers, and imports have augmented shipments of domestically produced wood furniture in the form of resales. The need to price wood furniture at levels competitive with imports has resulted in greater use of composite materials and decreased use of solid lumber and dimension. By contrast, as large kitchens have become a

visible demonstration of home owners' design tastes and wealth, cabinet consumers are purchasing products manufactured with greater relative volume of lumber and dimension.

While it is difficult to project the future of any wood product industry in a volatile world economy, the industrial model adopted by the kitchen cabinet industry has a higher probability of success than that of the domestic wood furniture industry. It allows consumers to choose what they want (thus customizing their order), incorporates a flexible production process, keeps business inventories at a minimum, and facilitates just-in-time manufacturing. Still, there is hope for a reemergence of the domestic wood furniture industry as the Amish furniture sector demonstrates that semicustom wood furniture can be built successfully in the United States. Furthermore, as the cost of manufacturing increases in China and other offshore locations, the cost of transporting large volumes of wood furniture over a great distance may facilitate greater domestic production.

Literature Cited

- Blackburn, G. 2008. A short history of chests of drawers. <http://www.taunton.com/finewoodworking/ProjectsAndDesign/ProjectsAndDesignAllAbout.aspx?id=3044>. Accessed December 15, 2008.
- Bridgwater, W. and S. Kurtz (Eds.). 1963. *Columbia Encyclopedia*. 3rd ed. Columbia University Press, New York. 2,388 pp.
- Bumgardner, M., R. Romig, and W. Luppold. 2007. Wood use by Ohio's Amish furniture cluster. *Forest Prod. J.* 57(12):6–12.
- Cochran, M. 2008. Bulletin of hardwood markets statistics: 2006. Research Note NRS-8. USDA Forest Service, Northern Research Station, Newtown Square, Pennsylvania. 22 pp.
- Cumbo, D., D. E. Kline, and M. Bumgardner. 2006. Benchmarking performance measurement and lean manufacturing in the rough mill. *Forest Prod. J.* 56(6):25–30.
- Hunter, S. L., S. Bullard, and P. H. Steele. 2004. Lean production in the furniture industry: The double D assembly cell. *Forest Prod. J.* 54(4):32–38.
- Kitchen Cabinet Manufacturers Association (KCMA). 2005. 50 Years of Defining Moments, KCMA Celebrates 50 Memorable Years of Cabinetmaking. KCMA, Arlington, Virginia. 52 pp.
- Lihra, T., U. Buehlmann, and R. Beauregard. 2008. Mass customisation of wood furniture as a competitive strategy. *Int. J. Mass Custom.* 2(3/4):200–215.
- Luppold, W. G. and M. Bumgardner. 2008. Forty years of hardwood lumber consumption: 1963 to 2002. *Forest Prod. J.* 58(5):7–12.
- US Department of Commerce (USDC), Bureau of the Census. 1980a. 1977 Census of manufactures, millwork, plywood, and structural wood members. MC77-I-24B n.e.c. USDC Bureau of the Census, Washington, D.C.
- US Department of Commerce (USDC), Bureau of the Census. 1980b. 1977 Census of manufactures, household furniture. MC77-I-25A. USDC Bureau of the Census, Washington, D.C.
- US Department of Commerce (USDC), Bureau of the Census. 1985a. 1982 Census of manufactures, millwork, plywood, and structural wood members, n.e.c. MC82-I-24B. USDC Bureau of the Census, Washington, D.C.
- US Department of Commerce (USDC), Bureau of the Census. 1985b. 1982 Census of manufactures, household furniture. MC82-I-25A. USDC Bureau of the Census, Washington, D.C.
- US Department of Commerce (USDC), Bureau of the Census. 1990a. 1987 Census of manufactures, millwork, plywood, and structural wood members, n.e.c. MC87-I-24B. USDC Bureau of the Census, Washington, D.C.
- US Department of Commerce (USDC), Bureau of the Census. 1990b. 1987 Census of manufactures, household furniture. MC87-I-25A. USDC Bureau of the Census, Washington, D.C.
- US Department of Commerce (USDC), Bureau of the Census. 1995a. 1992 Census of manufactures, millwork, plywood, and structural wood members, n.e.c. MC92-I-24B. USDC Bureau of the Census, Washington, D.C.

- US Department of Commerce (USDC), Bureau of the Census. 1995b. 1992 Census of manufactures, household furniture. MC92-I-25A. USDC Bureau of the Census, Washington, D.C.
- US Department of Commerce, International Trade Administration. n.d. Household and office furniture index page. <http://www.ita.doc.gov/td/ocg/furniture.htm>. Accessed September 3, 2008.
- US Department of Commerce (USDC), US Census Bureau. 1998. Annual survey of manufactures, statistics for industry groups and industries: 1996. USDC Bureau of the Census, Washington, D.C. 72 pp.
- US Department of Commerce (USDC), US Census Bureau. 2004a. 2002 Economic census wood kitchen cabinet and countertop manufacturing EC02-31I-337110 (RV). USDC Bureau of the Census, Washington, D.C.
- US Department of Commerce (USDC), US Census Bureau. 2004b. 2002 Economic census nonupholstered wood household furniture manufacturing EC02-31I-337122 (RV). USDC Bureau of the Census, Washington, D.C.
- US Department of Commerce (USDC), US Census Bureau. 2006a. Annual survey of manufactures, value of product shipments: 2005. USDC Bureau of the Census, Washington, D.C. 135 pp.
- US Department of Commerce (USDC), US Census Bureau. 2006b. Annual survey of manufactures, statistics for industry groups and industries: 2005. USDC Bureau of the Census, Washington, D.C. 340 pp.
- US Department of Commerce, US Census Bureau. 2008a. Annual survey of manufactures, value of product shipments: 2006. http://factfinder.census.gov/servlet/IBQTable?_bm=y&-ds_name=AM0631GS101. Accessed August 6, 2008.
- US Department of Commerce, US Census Bureau. 2008b. Annual survey of manufactures, statistics for industry groups and industries: 2006. http://factfinder.census.gov/servlet/IBQTable?_bm=y&-ds_name=AM0631GS101. Accessed August 6, 2008.
- US Department of Labor, Bureau of Labor Statistics. 2008. Producer price index commodity data. <http://data.bls.gov/PDQ/outside.jsp?survey=wp>. Accessed August 11, 2008.