The NBER Digest

NATIONAL BUREAU OF ECONOMIC RESEARCH

August 2011

IN THIS ISSUE

The Rise of IPO Activity around the World

During the past two decades, there has been a dramatic change in IPO activity around the world. In **The U.S. Left Behind: The Rise of IPO Activity Around The World** (NBER Working Paper No. 16916), co-authors **Craig Doidge, G. Andrew Karolyi,** and **Rene Stulz** study cross-country IPO activity around the world, its evolution over time, and the role of financial globalization. Using a database spanning 89 countries from the years 1990 to 2007, they find that IPO activity in the United States has fallen compared to the rest of the world. U.S. firms also go public less than one would expect based on the economic importance of the United States.

Although the worldwide share of IPO activity by U.S. firms still ranks near the top, the yearly average of U.S. IPOs has decreased from 27 percent in the 1990s to 12 percent in the 2000s — this despite a slightly increasing U.S. share of worldwide GDP over the period. The typical U.S. IPO is larger on average than an IPO in the rest of the world, but the U.S. share of total IPO proceeds worldwide also has declined, from about 30 percent in the 1990s to only 21 percent in the 2000s (through 2007). In fact, in 2006 and 2007 China's IPO proceeds exceeded those of the United States. Other countries that were predominant in the 1990s, such as the U.K., Singapore, Australia, and Hong Kong, also ceded substantial IPO share to a number of new countries which had sizeable IPO activity in the 2000s.

> "IPO activity in the U.S. has fallen compared to the rest of the world."

Doidge, Karolyi, and Stulz attempt to explain the causes of this decline. They find that in the early 1990s, the declining U.S. IPO share was due to the extraordinary growth of IPOs in foreign countries; in the 2000s, however, it was due to higher IPO activity abroad combined with lower IPO activity in the United States.

Global IPOs, that is IPOs in which some of the proceeds are raised outside the firm's home country, play a critical role in the increase in IPO activity outside of the United States. In 2007, proceeds raised in global IPOs accounted for 61 percent of total IPO proceeds, double the fraction raised in 1990. U.S. firms have never been active participants in the global IPO marketplace.

Global IPOs enable firms to overcome poor institutions in their country of origin by giving them access to global capital markets. Financial globalization increasingly enables firms whose value is most closely tied to the quality of institutions to use global IPOs and to take advantage of the institutions of foreign countries. As a result, firms from countries with weak institutions that still use domestic IPOs are firms for which the quality of institutions is relatively less important. Indeed, the quality of a country's institutions is positively related to its domestic IPO activity and negatively related to its global IPO activity. With the rise of global IPO activity compared to domestic IPOs, a country's laws and institutions have become significantly less important in affecting its rate and pace of IPO activity.

The authors show that the dynamics of both global and country-level IPO activity are strongly affected by global factors. Higher levels of worldwide IPO activity outside a country are strongly and positively related to the level of IPO activity in that country. However, IPO activity is also related to domestic market conditions. Firms are more likely to choose to go public at home when valuations are higher in the home market.

— Claire Brunel

The Psychological Costs of War: Military Combat and Mental Health

In **The Psychological Costs of War: Military Combat and Mental Health** (NBER Working Paper No. 16927), authors **Resul Cesur, Joseph Sabia,** and **Erdal Tekin** report that the mere length of deployment or breaks between deployments are far less significant for veterans experiencing post-traumatic stress disorder (PTSD) than the frequency of actual exposure to firefights. These researchers exploit the variation in overseas assignments that control for mental health prior to deployment in order to study the relationship between military combat and young adults' mental health. They find that U.S. soldiers who serve in combat zones are at greater risk of PTSD and are more likely to receive psychological or emotional counseling than their counterparts serving outside the United States in non-combat zones.

The authors estimate that just the combat-induced PTSD imposes two-year costs of $1.5 to $2.7 billion on the U.S. health care system. They determine that the psychological costs of combat are largest for soldiers who kill someone (or believe they have killed someone), are injured in combat, or witness the death or wounding of a civilian or a coalition member. These troops are at substantially increased risk of suicide or thoughts of suicide, depression, and PTSD. Interestingly, the authors find that observing the killing, death, or wounding of the enemy has no independent adverse psychological consequences. These findings are consistent with the hypothesis that strong feelings of guilt may accompany the death of non-combatants or fellow soldiers.

"U.S. soldiers who serve in combat zones are at greater risk of post traumatic stress disorder…than their counterparts serving outside the United States in non-combat zones."

The data used in this study come from the National Longitudinal Study of Adolescent Health (Add Health), conducted by the Carolina Population Center at the University of North Carolina at Chapel Hill. The Add Health is a nationally representative, school-based longitudinal study that began surveying U.S. adolescents in seventh to twelfth grades in the mid-1990s. Follow-up studies contain a relatively large sample of military servicemen and women and provide information on whether active-duty servicemen and women were deployed to a combat zone, assigned to a non-combat zone outside of the United States, or served on active-duty in the United States exclusively. Violent combat events are self-reported, and because the survey reaches back to adolescence, the authors of this paper have information on the respondent's mental health prior to any military deployment.

The measure of depressive symptoms used here comes from a version of the Center for Epidemiological Studies-Depression (CES-D) Scale; additional measures of mental health are generated by respondents' answers to a question about whether they had "received psychological or emotional counseling in the past 12 months" and whether "a doctor, nurse or other health care provider ever told you that you have or had post-traumatic stress disorder?"

This analysis provides credible estimates of the causal effect of combat service on young adults' psychological well-being. However, the authors caution that their estimates of the cost of PTSD include only the short-run costs for younger soldiers. Future research that follows soldiers as they transition back into civilian life will be able to provide further information on the longer-run effects of combat service.

— Matt Nesvisky

Do Higher Sales Tax Rates Encourage Local Governments to Court Retailers?

In many U.S. states, local governments can levy and keep revenue from sales taxes. These taxes give local government officials an incentive to encourage land use that will increase retail sales and increase retail employment. Since manufacturing generates lower sales tax revenue than retailing, local officials may encourage retailing at the expense of manufacturing, so that the number of manufacturing jobs may fall.

In **Fiscal Zoning and Sales Taxes: Do Higher Sales Taxes Lead to More Retailing and Less Manufacturing?** (NBER Working Paper No. 16932), **Daria Burnes, David Neumark,** and **Michelle J. White** find that an increase in the sales tax rate of one percentage point was associated with a decrease in manufacturing employment by 7 to 9 percent in Florida counties during 1992 to 2006. Overall retail employment was not related to changes in the sales tax rate, which ranged from 6 to 7.5 percent over the sample period, but an increase in employment in big box and mall anchor stores of between 15 and 17 percent was associated with each percentage point increase in the local sales tax. The authors interpret these changes, at least in part, as the result of zoning policy. Between 1992 and 2008, Florida's inflation-adjusted local sales tax revenue increased by 380 percent while property tax revenues increased by just 8 percent.

"Since manufacturing generates lower sales tax revenue than retailing, local officials may encourage retailing at the expense of manufacturing."

The extent to which local government officials encourage retailing also appears to vary within counties. Because shoppers have an incentive to shop where sales taxes are lower, they are more likely to cross county borders in search of good deals if they live closer to them, implying that an increase in a county's sales tax should lead to more retailing and retail jobs in interior regions, but less retailing and retail jobs in border regions. The authors define areas within one mile of a county border as a border region and the rest of the county as an interior region, and they find that a one percent increase in the sales tax rate is associated with an increase in big box and anchor store employment of 40 to 48 percent in interior regions, compared with a decline of between 15 to 17 percent in border regions. The opposite effects are observed for manufacturing: an increase in the sales tax is associated with a negative effect on manufacturing in interior regions and a positive effect in border regions.

— Linda Gorman

The Impact of Chinese Imports on Innovation, IT, and Productivity

In **Trade-Induced Technical Change? The Impact of Chinese Imports on Innovation, IT, and Productivity** (NBER Working Paper No. 16717), authors **Nicholas Bloom, Mirko Draca,** and **John Van Reenen** examine more than a half million firms in 12 European countries between 1996 and 2007. They find that every 10 percentage point rise in Chinese imports in a firm's industry was associated with an increase of: 3.2 percent in patents, 3.6 percent in IT spending, 12 percent in R and D spending, and 2.6 percent in total factor productivity (TFP). The authors observe that more innovative firms tended to grow while the less innovative ones tended to shrink or disappear altogether. In fact, they conclude, a surge in Chinese imports appears to have been responsible for about 15 percent of the technological upgrades at European firms between 2000 and 2007. At the same time, that surge led to decreases in employment, profits, prices, and skill share in the affected industries. Imports from other low-wage nations had a similar impact, but imports from developed nations did not.

"What may be happening is that trade is stimulating technical progress, which in turn is increasing the demand for skilled labor," the authors write. "It is not simply that patents per worker, or average TFP, increases — total innovation in the affected firms and industries expands when they face more exogenous threats from Chinese imports." One explanation may be that companies already have certain "trapped factors," such as equipment or firm-specific skills, which they might as well try to use to develop new processes or products. Opening up to trade effectively lowers their opportunity cost of innovation.

"Increased import competition with China has caused a significant technological upgrading in European firms."

At the same time, employment is being reallocated among firms. For every 10 percentage point increase in imports, employment falls 3.5 percent overall in the affected sectors, but this decline is not shared evenly. Highly innovative companies are more likely to grow; less innovative ones are more likely to shrink. A 10 percentage point increase in Chinese imports decreases the probability of survival of European firms by about 17 percent.

To correct for the possibility that unobserved technological shocks affected their results, the authors examine the effects of Chinese imports after China`s entry into the World Trade Organization, which led to the end of import quotas on textiles and apparel. This allows them to study industries that had widely different experiences after trade liberalization and to focus on textiles and apparel: although relatively low tech, they were still the source of more than 22,000 patents from European companies during the period they study. The authors also control for differential industry-specific time trends and exploit the fact that Chinese imports tended to increase where China already had established a "bridgehead" by the mid-1990s. The results support their main conclusion that Chinese trade spurred innovation.

The authors conclude that the surge in Chinese imports was responsible for about 15 percent of European technological change for the whole period from 2000 to 2007, but the impact now seems to be growing stronger. They write that "this effect appears to be increasing over time and may even be an underestimate as we also identify a role for offshoring to China in increasing TFP and IT adoption (although not for innovation). This suggests that increased import competition with China has caused a significant technological upgrading in European firms in the affected industries through both faster diffusion and innovation."

— Laurent Belsie

Fuel Tax Incidence and Supply Conditions

The division of the burden of fuel taxes between producers and consumers, commonly referred to as "tax incidence," is a key element in current debates about energy policy. In **Fuel Tax Incidence and Supply Conditions** (NBER Working Paper No. 16863), authors **Justin Marion** and **Erich Muehlegger** examine the effect of diesel and gasoline taxes on retail fuel prices. They find complete pass-through of both federal and state diesel and gasoline taxes to consumers. They also find that these taxes are reflected immediately in retail prices; in some cases, retail prices even may rise by more than the tax increase. The pass-through rate for diesel fuel is amplified in cold months, particularly in states with a high fraction of households using heating oil, because heating oil and diesel are chemically equivalent.

Refinery capacity constraints and wholesale inventory levels also affect the pass-through of diesel and gasoline taxes. However, the authors point out that seasonal differences in refinery capacity utilization may be correlated with differences in elasticities of demand for fuel, making it difficult to interpret these findings. Low inventory levels are associated with higher tax-inclusive prices for both gasoline and diesel fuel, and with a greater tax pass-through for gasoline.

The authors also find a positive and significant relationship between the stringency of state gasoline content regulations and tax incidence. In a state like California, which requires the use of a single gasoline formulation throughout the state, the degree of pass-through is greater than in states that permit some variation in such formulation.

> "Both federal and state diesel and gasoline taxes [are fully passed on] to consumers … [and] are reflected immediately in retail prices."

The authors' results suggest that under normal market conditions the benefits of fuel tax holidays are likely to accrue to consumers, but those benefits are likely to be shared by both consumers and producers during times when fuel supply constraints exist. Because the burden of fuel taxes falls primarily on consumers, and the demand for diesel and gasoline is not elastic, producer profits are not likely to fall as these taxes rise.

— Lester Picker

The Division of Founder Equity in New Ventures

The shares of entrepreneurial companies can be divided among the firm's founders in a number of ways that may, or may not, take account of the relative value of each one's contributions. One simple solution is to value all members equally, which avoids making value judgments and requires only minimal negotiation. However, an equal split of founder equity may not always be appropriate — some founders may feel like they are contributing relatively more and thus expect to receive more shares.

In **The First Deal: the Division of Founder Equity in New Ventures** (NBER Working Paper No. 16922), authors **Thomas Hellmann** and **Noam Wasserman** focus on these issues. Using a proprietary dataset including information on 1,476 founders in 511 private ventures, they find a surprisingly high incidence of equal splitting. Roughly one third of founder teams divide their equity stakes equally. Arguably, the division of equity is one of the key decisions taken by founder teams. Even simple calculations suggest that the amount of money at stake is significant.

> "Roughly one third of founder teams divide their equity stakes equally."

Hellmann and Wasserman theorize that founders have a choice between accepting an equal split without having to negotiate or undertaking costly negotiations to come up with a differentiated allocation of equity shares. They then consider the determinants of equal splitting and they identify three important founder characteristics — idea generation, prior entrepreneurial experience, and founder capital contributions — that would reduce that likelihood. Next, they show that these same founder characteristics also significantly affect the share premium in teams that split the equity unequally. Finally, the authors show that equal splitting is associated with lower pre-money valuations in first financing rounds. As predicted by their theory, this valuation effect is driven by unobservable founder differences, and it is more pronounced in teams that make quick decisions about founder share allocations and negotiate very quickly — in less than a day.

The authors also perform some counterfactual calculations that estimate the amount of money "left on the table" by stronger founders who agree to an equal split. They estimate that the value at stake in a typical start-up is approximately 10 percent of the firm equity, 25 percent of the average founder stake, or $450K in net present value.

— Lester Picker