

“A Treacherous Triangle?: China and the Transatlantic Alliance”

SAIS Review vol. XXVII no. 1 (Winter-Spring 2007)

By Christopher Griffin and Raffaello Pantucci

Abstract *The United States and Europe avoided diplomatic disaster in 2005 when the European Union narrowly decided not to lift its arms embargo on the People's Republic of China (PRC). Brussels was handed a convenient pretext for shelving the question when China passed an "Anti-Secession Law" to ratchet up tension in the Taiwan Strait, but the transatlantic alliance cannot rely on such luck next time the issue arises. Although the United States and Europe initiated a senior level dialogue on Asia following last year's arms embargo crisis, these talks should be expanded to cover a wider range of working-level operational questions*

After years of deteriorating transatlantic relations, the second administration of President George W. Bush targeted its first major diplomatic gesture at Europe, sending newly appointed Secretary of State Condoleezza Rice there in February 2005 to begin patching over the damage from the Iraq War. Although such contentious issues as enemy combatants detained at Guantanamo Bay, the continued occupation of Iraq, and enhanced NATO responsibility for operations in Afghanistan presented a the Secretary with a full agenda, a surprising issue threatened to overshadow Secretary Rice's transatlantic breakthrough: how would the United States respond to Europe's pending decision to lift its arms embargo on the People's Republic of China?

Although Secretary Rice emphasized that she had productive talks on the matter with her European counterparts, the decision to lift the embargo appeared preordained in Brussels, and the U.S. Congress was less restrained in its response. Critics blasted Europe for selling out the alliance in order to turn a buck in Beijing, and legislators such as Senator Richard Lugar threatened to cut transatlantic defense-industrial cooperation if Europe lifted the embargo. In the face of such acrimony from the U.S. and growing domestic criticism, Brussels backed down, but the issue is not dead.

The clearest indication that the embargo is still in play is that Europe's leadership says so. When Chinese premier Wen Jiabao attended the Ninth China-European Union Summit in September 2006, he received a pledge that Europe would continue efforts toward lifting the embargo. One month later, French President Jacques Chirac declared his continued opposition to the embargo in a joint communiqué with Hu Jintao: "The moment has come for the E.U. to make the most of the expanding partnership between the E.U. and China, most notably by lifting the arms embargo which is no longer pertinent to the present situation."¹

The ongoing arms embargo controversy points to a deeper tension: Washington fears that Europe will be an irresponsible actor in Asia, while Brussels suspects that Washington won't accept any European role at all. Bridging this gap is not simply a matter of overcoming mutual suspicion, for Washington and Europe have vastly different interests in Asia both in terms of scope and scale. And the rapid growth of Sino-European ties

indicates that those interests will continue to diverge in the absence of a strong countervailing effort.

A Budding Strategic Partnership?

The primary source of transatlantic tension over the rise of China is the fact that while Washington sowed its strategic roots in Asia over a century ago, Europe is a relative newcomer whose interests in the region have exploded in the past decade.² China is the focus of Europe's burgeoning economic ties to East Asia, and Sino-European trade has taken off since Beijing emerged from the post-Tiananmen chill of the early 1990s.

China is now Europe's second largest trading partner, and Europe China's first. Trade between the two amounted to some \$264 billion (€210 billion) in 2005, with European exports to China valued at \$65 billion (€52 billion) and imports from China at \$198 billion (€158 billion).³ Within Europe, Germany is China's leading trade partner, accounting for around 30% of total E.U.-China trade. France, Italy, the Netherlands, and the United Kingdom account for most remaining bilateral trade, who between them are responsible for some 78.2% of E.U. exports to China.⁴

As with their American counterparts, many European businesses are infatuated with the promise of the China market and have set out to establish strong positions there early. Machinery and agriculture dominate Europe's exports to China, with the German *mittelstand*⁵ in particular benefiting from exporting their engineering savvy.⁶ But like many U.S. businesses, Europeans have also found that an unpredictable regulatory environment and intellectual property theft make China a risky place in which to conduct business. Although European public attitudes have been wary of the flood of cheap Chinese imports, some have in fact been very receptive to inwards Chinese purchases of local firms. In a number of cases, Chinese attention has been welcomed—when the Nanjing Automobile Corporation decided to purchase (and thereby saved) the British MG Rover brand, for example. On top of this, European inward investment agencies have aggressively sought to attract Chinese direct investment and have targeted high technology fields in an effort to avoid the outsourcing of manufacturing.⁷

Most European leaders are keen to promote national champions, and often their trips to the Middle Kingdom seem to primarily serve as business junkets. For example, when then German Chancellor Gerhard Schroeder visited Beijing in December 2003, he helped Siemens sell Beijing an old plutonium processing plant for \$63 million (€50 million). And courting China is a bipartisan affair: during her first visit to China in May 2006, Chancellor Angela Merkel signed an additional deal for Siemens to build some 500 trains with local partners for a total value of some \$377 million (€300 million).

The rapid growth of Sino-European trade has coincided with the development of a stronger sense of common European political identity. A growing political role in Asia has fit nicely into Brussels' self-image as an emerging global actor. Unlike other European foreign policy relationships, China is neither a military threat nor geographically adjacent to Europe, meaning that it is easier to develop an internal E.U.

consensus on the subject. European leaders launched the annual Asia-Europe Meeting in 1996 to provide the opportunity for a summit-level event with their Asian counterparts without an American presence. The bilateral E.U.-China Summit has been held each year since 1998, and both sides now regularly exchange ministerial and summit level officials—the large number of European states means that the E.U. has an almost continual stream of officials heading east.

Security ties have also begun to pick up in recent years. Most E.U. member states now have a military representative in Beijing; France has three, Germany, Italy, Poland, and the United Kingdom each have two (the U.S. on the other hand has twelve). Other "soft security" interactions between the E.U. and China include port visits by French, British, Italian, Irish, and German navies, with converse visits by the Chinese navy to French, German, Italian, British, Greek, and Portuguese ports. Chinese ships have also participated in joint exercises with French and British vessels. These are admittedly small steps in comparison to those of the U.S. in the region, but they are demonstrative of a growing relationship.⁸

This growth in bilateral relations has met policy goals in both Beijing and European capitals. China finds that relatively conservative European diplomacy complements its diplomatic focus on avoiding confrontation and respecting national sovereignty. Thus, the security concerns that dominate China's relations with Washington do not encumber China's dealings with Europe. For example, although the inaugural Asian-Europe Meeting was held immediately after the March 1996 missile crisis in which Beijing "bracketed" Taiwan with short-range missiles, European officials made no public effort to address China's aggressive behavior leading up to or during the conference.

David Shambaugh of George Washington University offers perhaps the most optimistic assessment, identifying the Sino-European relationship as an emerging "axis" in international relations based on three pillars: engaging China through multilateral institutions that enhance its participation in international affairs; intensifying bilateral Sino-European ties; and improving China's "domestic capacity" to govern.⁹ In all, this is quite an ambitious agenda for so young a partnership.

Brussels Moves on the Embargo

An early litmus test for the Sino-European strategic partnership is the thus far frustrated effort to lift the arms embargo Europe imposed following the Tiananmen Square incident, China's bloody 1989 crackdown on pro-democracy demonstrators in Beijing and their supporters throughout the country. In its inaugural "E.U. Policy Paper," released in October 2003, China formally broached the question of ending the arms embargo. The final paragraph of this document calls on the E.U. to "lift its ban on arms sales to China at an early date so as to remove barriers to greater bilateral cooperation on defense industry and technologies."¹⁰

Over the following year, a series of E.U. leaders announced their support for lifting the ban, most vocally Gerhard Schroeder and Jacques Chirac. While conducting an October

2004 state visit to Beijing, President Chirac declared that he would personally strive to end the embargo, the continuation of which was "motivated purely and simply by hostility."¹¹ Europe took a major step toward meeting Beijing's request in December of the same year at the Seventh E.U.-China Summit, in which the E.U. "confirmed its political will to continue to work towards lifting the embargo."¹²

Two weeks later, the Council of the European Union approved the Joint Statement and called on the E.U. presidency to "finalize the well-advanced work in order to allow for a decision [on the embargo]" and "underlined that the result of any decision should not be an increase of arms exports from E.U. Member States to China, neither in quantitative nor qualitative terms."¹³ The Council further stressed that the E.U. should move to adopt a revised Code of Conduct on arms exports and a new instrument on exports to post embargo countries, known to as the "Toolbox."¹⁴

The combination of these Chinese, European governmental and E.U. statements form a tapestry of interwoven yet conflicting interests in the budding Sino-European relationship. The official line from Brussels was that in light of the E.U.'s rapidly developing relationship with China, it made little sense to keep Sino-European relations on par with the E.U.'s relationships with Myanmar, Zimbabwe, or Sudan—the other countries subject to E.U. arms embargoes.¹⁵ But as the Council decision above indicates, this move does not intend to result in any increase of arms exports to the E.U., and other official statements on the pending decision emphasized that adopting an enhanced Code of Conduct and "Toolbox" would plug holes in an already leaky embargo.¹⁶

In contrast, Beijing views an end to the embargo as a means to increase arms purchases and defense-industrial cooperation with Europe—having said as much in its 2003 policy paper. Recent Chinese gains in arms imports from Europe, which according to E.U. annual reports, were authorized to expand from approximately \$51 million to \$430 million between 2001 and 2004 can in part explain this Chinese view.

Different European national governments also have divergent interests. Despite the Council's intention to strengthen the Code of Conduct, reports in early 2005 indicated that Paris had entered into talks with Beijing on the sale of advanced Mirage 2000-9CS fighter aircraft.¹⁷ And other analysts have observed that even if European countries do not sell whole weapons platforms to China in a post-embargo world, Beijing seeks to import the military software that it currently cannot produce domestically or import in sufficient quality from Russia.¹⁸ European components and subsystems for command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) could enhance the lethality of China's military hardware, even if Europe never sells a single round of ammunition.

**Table 1. European Union Arms
Export Licenses to China, 2001–2004**

	2001	2002
France	n/a	\$93,115,756 (€105,431,246)
Germany	\$90,382 (€96,411)	\$7 (€10)
UK	\$46,080,000 (£32,000,000)	\$67,563,987 (€76,500,000)
EU Total	\$51,013,091 (€54,415,665)	\$185,287,970 (€209,794,157)

	2003	2004
France	\$182,177,920 (€171,530,641)	\$213,439,643 (€168,900,766)
Germany	\$1,164,247 (€1,096,261)	\$1,115,706 (€882,890)
UK	\$119,429,059 (€112,455,000)	\$186,521,897 (€147,600,000)
EU Total	\$441,608,650 (€415,820,913)	\$430,496,859 (€340,664,219)

Notes: All data are from EU Annual Report on the Implementation of the Code of Conduct, various editions.

Available online from the Stockholm Institute of International Peace, <<http://www.sipri.org/contents/expcon/annrep.html>>.

All data are for annual arms export licenses issued per year; most countries do not provide data on the value of arms exports.

Given these conflicting statements, and the possible "worst" outcomes that they implied, the U.S. response to Europe's effort to lift the arms embargo was vociferous. On the one hand, Congress feared that American soldiers serving in the region might one day find themselves facing European weaponry in a showdown over Taiwan, while on the other, there was the fear that American technology or weaponry sold to Europe could leak out and end up again facing American forces in the Asia Pacific region. In February 2005, the U.S. House of Representatives adopted a resolution stating that it deplored increased E.U. sales and moves to lift the embargo, and declaring that those moves "place European security policy in direct conflict with U.S. security interests." The resolution, which passed by a vote of 411-3, further warned that if Europe did not change course, the Congress would have to consider "limitations and constraints" on transatlantic defense-industrial ties.¹⁹

American security partners in Asia largely shared these concerns, albeit expressed less strenuously. Then Japanese Foreign Minister Nobutaka Machimura told his French counterpart in 2005 that his government was opposed to the E.U.'s lifting of the embargo. Taiwan was particularly anxious over the E.U.'s shift, as it feared that the balance in the Taiwan Strait would further deteriorate following a repeal of the embargo.²⁰

Europeans were stunned by such U.S. acrimony for a decision that Brussels had been telegraphing across the Atlantic for years. Brussels wondered how the U.S. could accuse the E.U. of being irresponsible when it had previously sold both dual use technologies and arms to China. This perceived combination of American paranoia and hypocrisy confused many Europeans when they observed the landscape on the ground: Why would China risk a war with Taiwan when the island is one of the largest foreign investors in the Chinese economy and a de facto U.S. security guarantee shields it? How could America really feel threatened by a country with a military budget of less than a quarter of the Pentagon's?

Furthermore, Europeans felt that Beijing was already welcomed into the bosom of the international community with the decision to send the 2008 Olympics to Beijing. They complained that the U.S. was unfairly criticizing the new Code of Conduct and Toolbox before they were even formally released, implying that Washington would not accept any rules that Europe promulgated for its future relationship with China, other than an embargo that already was not working especially well. And Brussels could not understand America's rejection of a move that most Europeans saw as a natural and obvious evolution in their strategic relationship with China. It was, in short, a classic failure of transatlantic communication.

As the U.S. ratcheted up criticism, European leaders also started to feel some domestic pressure against lifting the embargo. Both the German Bundestag and the European Parliament passed resolutions overwhelmingly against the proposal. At the grassroots level, there was a certain amount of disquiet about the notion of selling weaponry to China while Beijing keeps some 2,000 political prisoners from the Tiananmen crackdown—the proximate cause of the embargo—behind bars.

The crisis reached a seeming denouement in March 2005 when Brussels shelved the issue, using the pretext of the Chinese decision to pass the Anti-Secession Law, with which Beijing established a legal basis for invading Taiwan.²¹ This essentially face-saving measure allayed regional and American concerns, but did not end the long-term movement towards lifting the embargo, a direction in which Beijing and some in Europe will continue to push.

The Fruits of Dialogue?

Although the 2005 arms embargo crisis introduced yet another serious dispute into U.S.-European relations, it also opened up the door for enhanced dialogue about how the U.S. and Europe can coordinate their policies in Asia. As the episode neared its end, the two sides agreed to do just that. Assistant Secretary of State for European Affairs Daniel Fried summarized the goal of these exchanges:

We decided with our European colleagues that we were simply putting this debate in the wrong order; we should not be debating about the arms embargo, we should be having a deeper strategic discussion about Asia and about China and about how Europe and the

United States will work with China to make sure that its development, its rise, if you will, contributes to international security and prosperity.²²

In addition to these senior-level talks, mutual understanding has also been enhanced by U.S. Department of State-sponsored trips that have brought large numbers of U.S. Asia policy experts to visit Europe in the period since the arms embargo crisis, as well as delegations sponsored by nongovernmental bodies such as the German Marshall Fund. These exchanges have led to more common understanding of the complexities of Asian politics and security issues, as well as of American views on the region in academic, business and government circles throughout Europe. The result is that many U.S. and European elites are reconciling their divergent perspectives on China. While Europe's view is certainly not the same as Washington's, it has now developed into a more rounded perspective that will in the future "provide a broader basis for cooperation in handling relations with Beijing."²³

But there are still significant gaps. When the authors recently met with a senior E.U. Commission official, he informed us that the U.S. should pull its forces out of Taiwan—which it did more than a quarter of a century ago—and face the fact that the same problems of imperial overstretch that had previously befallen the European empires would eventually overtake the U.S. role in Asia. Hardly the stuff of enhanced strategic dialogue.

These differences are reflected in divergent public opinion survey results about China in Europe and America. According to the German Marshall Fund, while Europeans and Americans report almost identical feelings of "warmth" toward China, they have different threat perceptions. Whereas 35 percent of Americans view rising China as a military threat, only 22 percent of Europeans feel the same. The results almost flip when asked if China is an economic threat, to 29 and 37 percent among American and Europeans, respectively.²⁴

And in private settings, senior U.S. officials admit that while their European interlocutors have demonstrated rapidly increasing knowledge of the strategic realities that the U.S. faces in Asia, the historical absence of operational talks—what to do in the case of regional contingencies—means that the two sides have to work through more practical discussions.

New Fora, New Agendas

The most apparent means to improve on a moderately successful dialogue is to add more dialogue upon it. While the schedules of senior officials will not likely allow them to hold much more than their current schedule of meetings, there is room for more frequent working-level dialogue to coordinate policies. Topics should include export controls to China, the growing Chinese presence in Africa, joint planning for regional contingencies in Asia, and mutual understanding on our stakes in the future of Taiwan.

Regardless of the future of the embargo, Europe should work to make the code of conduct mandatory: draw up a list of items, with American consultation, of what items

should be prohibited from export to China; standardize reporting throughout the Union; and rephrase the stipulation of the embargo that prohibits members from selling 'whole' weapons and weapons systems to include some reference to weapons parts that are sold.²⁵ This last requirement is increasingly crucial, especially in light of reports coming out of the United Kingdom that strategic export licenses (which are needed to sell arms abroad) worth \$131 million (£70 million) were granted to China in the period between July 2005 and June 2006.²⁶

The African case is a particular example where Europe can be an especially valuable partner in helping the U.S. understand China's growing global role. Where Americans complain about European strategic detachment from Asia, the same can be returned in spades against U.S. disinterest in the African continent. Europe's higher level of engagement with African countries will allow it to better monitor Beijing's inroads there, a topic about which both sides require greater understanding.

Serious thought now about operational responses to various security contingencies in Asia could save both lives and bolster the role of the transatlantic alliance in Asia. The December 2004 Asian tsunami disaster demonstrated that planning for joint naval operations, civilian evacuation, and enhanced logistical capabilities is essential even when diplomatic sensitivities preclude discussing military scenarios. The creation of a crisis management joint-planning cell between NATO and the E.U., which would grow out of the current Civil-Military cell embedded in the E.U. Military Staff structure, could provide a venue to start planning for crisis scenarios that may arise in the Asian region and elsewhere.²⁷

One area that will require enhanced U.S. and European dialogue is the ever-tense situation in the Taiwan Strait. As Adam Ward has pointed out, "the European Union has traditionally tended to speak not so much sotto voce [on the question of Taiwan] as in a barely audible whisper."²⁸ A clear statement that Washington and Brussels share a common interest in the peaceful determination of Taiwan's future in accordance with the will of the Taiwanese people is consistent with our diplomatic obligations to China. And as with Africa, Europe has experience with the trials of recently democratized countries that is directly relevant to Taiwan, which is overcoming the legacy of authoritarian rule while reforming its constitution, government, and defense establishment for democracy.

Where the U.S. and Europe address new agenda items, they should also reconsider the venues they use. NATO provides an interesting forum for engaging Europe in Asia in a way that enhances transatlantic cooperation and creates a countervailing force to Chinese dominated regional organizations like the Shanghai Cooperation Organization. With the growing importance of energy security, Central Asia and the Caucuses with their abundant energy fields would offer a perfect agenda item for the U.S. and Europe to align their policies in a region that China has been overtly courting to assuage its insatiable need for hydrocarbons.

Meanwhile, the concept of "flexible partnerships" through NATO also provides a unique model for engaging Asian countries in a way that enhances U.S.-European cooperation in

Asia by working toward modest common objectives. By cooperating with Asian states and listening to their concerns over China's rise, the E.U. can possibly deflect some American criticism that it is meddling in a region it does not comprehend. Furthermore, the U.S. would be able to rely in a more concrete way upon European support in a region that is looking increasingly dangerous, especially in the wake of the North Korean nuclear test.

A dual imperative should drive the transatlantic approach to Asia. The U.S. can hardly command Europe not to meddle in Asian affairs—doing so will only play in the hands of those in Europe who advocate closer ties to China as a counterbalance against American power. And Europe cannot afford to openly spurn Washington's vital interests in the region if it wants U.S. leaders to pay attention to more immediate European concerns. While this modest goal may not be the most high-minded basis on which to build a strategic consensus, it appears to be the best way to avoid a more serious breach in transatlantic relations in the years ahead. Adopting some of the proposals here may provide progress in the right direction.

Christopher Griffin is a research fellow in Asian studies at the American Enterprise Institute in Washington, DC, and a contributing editor to *Armed Forces Journal*. Raffaello Pantucci is a research associate at the International Institute for Strategic Studies in London.

Notes

¹ Agence France-Presse, "Leaders of China, France Call for Lifting EU Arms Embargo," October 26, 2006.

² Needless to say, Europe's involvement in the politics of Asia stretch back to the seventeenth century with the arrival of early settlers and exploded following the Opium War of 1834. However, in a period roughly bridging the French defeat at Dien Bien Phu and the imposition of the post-Tiananmen arms embargo, European countries generally (the notable exception being of the UK in Hong Kong) played a minimal role in Asian affairs, and "Europe" as an integrated actor none at all.

³ European Union Directorate General for Trade. "EU Bilateral Trade with China." various editions, <http://trade.ec.europa.eu/doclib/docs/2006/september/tradoc_113366.pdf>.

⁴ Figures drawn from national trade bureaus of European Countries and the United Nations Trade Statistical database.

⁵ German small- and medium-sized enterprises/businesses.

⁶ Benoit, Bertrand and Geoff Dyer. "The Mittelstand is Making Money in the Middle Kingdom." *Financial Times*, June 6, 2006.

⁷ Harney, Alexandra and Andrew Ward, "The Coming Attraction: rich nations prepare a welcome for Chinese investment." *Financial Times*, October 7, 2005.

⁸ Gill, Bates. "Lifting of the EU arms embargo to China." Testimony before the Senate Foreign Relations Committee, March 16, 2005.

⁹ Shambaugh, David. "China and Europe: The Emerging Axis," *Current History*, 243, September 2004.

- ¹⁰ "EU Policy Paper." Ministry of Foreign Affairs of the People's Republic of China. October 13, 2003. <http://www.fmprc.gov.cn/eng/topics/ceupp/t27708.htm>.
- ¹¹ Bremner, Charles and Oliver August. "French Scorn—Chirac's Outburst Against U.S." The Times. October 11, 2004.
- ¹² "Joint Statement of the 7th EU-China Summit." Foreign Ministry of the People's Republic of China. December 9, 2004. <http://www.fmprc.gov.cn/eng/wjdt/2649/t174512.htm>.
- ¹³ "Presidency Conclusion 16/17 December 2004." The Council of the European Union. February 1, 2005, http://ue.eu.int/ueDocs/cms_Data/docs/pressData/en/ec/83201.pdf.
- ¹⁴ Ibid.
- ¹⁵ Ellen Bork has observed elsewhere that there is a certain irony to this distinction among embargoed states, as "Zimbabwe, for example, actually has an opposition party, even though it's persecuted. And neither Zimbabwe nor Burma is building up its military capacity to take over a democratic country, which China is." See the transcript of AEI conference "Europe, China and the Arms Embargo," February 1, 2005, <http://www.aei.org/events/filter.all,eventID.994/transcript.asp>.
- ¹⁶ "Factsheet: EU Arms and Dual Use Exports Policy and EU Embargo on China." The European Union. February 2005, http://ue.eu.int/uedocs/cmsUpload/FACTSHEET_ON_THE_EU_AND_CHINA.pdf.
- ¹⁷ "Taiwan Air Force Fears Impact of Possible China, France Jet Deal." BBC Monitoring Asia Pacific. April 11, 2005.
- ¹⁸ Archick, Kristin, Richard Grimmett, and Shirley Kan. "European Union's Arms Embargo on China: Implications and Options for U.S. Policy." Congressional Research Service Report. May 27, 2005.
- ¹⁹ U.S. House of Representatives, "H. Res. 57," February 2, 2005.
- ²⁰ The Mirage fighter aircraft that France was reported as preparing to sell to China, for example, are more advanced versions of the Mirage fighters that the Republic of China Air Force flies.
- ²¹ Dombey, Daniel. "EU Drive to Lift China Arms Ban Falls Apart." The Financial Times, June 14, 2005.
- ²² "The United States and Europe: Addressing Global Challenges." U.S. Department of State. September 19, 2005. <http://www.state.gov/r/pa/ei/pix/b/eur/53586.htm>.
- ²³ Strategic Survey 2006. International Institute for Strategic Studies. London: Routledge, August 2006, 287.
- ²⁴ Transatlantic Trends 2006. German Marshall Fund of the U.S. & Compagnia di San Paolo. http://www.transatlantictrends.org/doc/2006_TT_Key%20Findings%20FINAL.pdf.
- ²⁵ Medeiros, Evan S. & Seth G. Jones. "Heading off European arms to China." The Hill. March 2, 2005.
- ²⁶ Barnett, Anthony. "Human rights concerns fail to staunch flow of UK arms." The Observer. October 15, 2006.
- ²⁷ Cronin, Patrick. "Riga should deliver wake-up call on EU-NATO relations." The European Voice. November 9, 2006.
- ²⁸ Ward, Adam. "The Taiwan Issue and the Role of the European Union." China's Rise: Diverging U.S.-EU Perceptions and Approaches. Berlin: German Institute for International and Security Affairs, 2005, 45.