Gaza's Tunnel Phenomenon: The Unintended Dynamics of Israel's Siege

Nicolas Pelham

This article traces the extraordinary development of Gaza's tunnel phenomenon over the past decade in response to Israel's economic asphyxiation of the small coastal enclave. It focuses on the period since Hamas's 2007 takeover of the Strip, which saw the industry's transformation from a clandestine, makeshift operation into a major commercial enterprise, regulated, taxed, and bureaucratized. In addition to describing the particulars of the tunnel complex, the article explores its impact on Gaza's socioeconomic hierarchy, strategic orientation, and Islamist rule. The larger geopolitical context, especially with regard to Israel, the Sinai Peninsula, and the Nile Valley, is also discussed. The author argues that contrary to the intentions of its architects, the siege precipitated the reconfiguration of Gaza's economy and enabled its rulers to circumvent the worst effects of the blockade.

Visitors approaching Rafah can be forgiven for thinking they have stepped back in time to the 1948 Nakba. On the southern reaches of the town, the horizon is interrupted by hundreds of white tents flapping in the wind. Instead of dispossessed refugees, the tents shelter the mouths of hundreds of tunnels, which for the past five years have played a critical role in providing a lifeline for Gazans hit by a punishing siege. Beneath the awnings, thousands of workers shovel heavy materials for Gaza's reconstruction. Front-end loaders plow through the sands, loading juggernauts with gravel and enveloping the entire zone in dust clouds. Tanker trucks fill with gasoline from underground reservoirs; customs officials weigh trucks and issue the tax vouchers required to exit. The ground that Israel leveled in 2004 to create a barren corridor separating Gaza from Egypt is today abuzz with activity on and under the surface, as Gazans operate a tunnel complex that has become the driver of Gaza's economy and the mainstay of its governing Palestinian Islamist movement, Hamas.[1]

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A "LIFELINE" TAKES SHAPE

For millennia, Rafah was the first stopping place for merchants crossing the desert from Africa to Asia. Israel's establishment in 1948 did not sever the tie, for Gaza was administered by Egypt until Israel's 1967 occupation. Even after, Bedouins crossed the border unimpeded, continuing to mingle and marry. Only in 1981, when Egypt and Israel demarcated their frontier along Gaza's southern edge as part of their 1979 peace treaty, did separation really set in.

No sooner had the agreement's implementation divided Rafah between Israel and Egypt than Bedouin clans straddling the fourteen-kilometer border began burrowing underneath, particularly at the midpoint where the earth is softest. Israel's first recorded discovery of a tunnel was in 1983. To avoid detection, Gazans dug their tunnels from the basements of their houses to a depth of about fifteen meters, headed south for a few dozen meters, and then resurfaced on the Egyptian side of the border, often in a relative's house, grove, or chicken coop. By the late 1980s, tunnel operators were importing such basics as processed cheese, subsidized in Egypt and taxed in Israel, and probably some contraband as well, including drugs, gold, and weapons.

Israel's "soft quarantining" of Gaza—the steadily tightening restrictions on the movement of persons and goods into Israel—began with the Oslo peace process and in preparation for the establishment in the Strip of the Palestinian Authority (PA) in 1994. After Oslo's signing, Israel built a barrier around Gaza. Though access continued through Israel's terminals, periodic closures led Gazans to seek alternatives. The perimeter barrier was among the first targets of protestors when the Al-Aqsa intifada broke out in September 2000, but by June 2001 Israel had replaced it with a higher, grimmer, more impenetrable upgrade. Frequent lockdowns at Israel's terminals and the destruction of Gaza's seaport and airport in 2001, coupled with the militarization of the intifada, intensified the drive for outlets south. Hence the expansion and upgrading of the tunnels, which for the first time served as safety valves for wholesalers to alleviate the artificially created shortages.

Given their quest for weapons and the need for funds to finance operations during the intifada, the various Palestinian political factions operated the longest and deepest tunnels. The cash-strapped PA sought to co-opt clans along the border where tunneling was easiest. Sami Abu Samhadana, a senior PA security official and prominent Fatah leader in Gaza, himself from a Bedouin clan straddling the Rafah frontier, oversaw much of the expansion. This fusion of security and business interests, of militia activity and private entrepreneurship, was to become a hallmark of future development.

Successive Israeli military operations aimed at defeating the second intifada and widening the buffer zone between Gaza and Egypt also targeted the tunnels.[2] In the lead-up to implementing its unilateral Gaza withdrawal plan, Israel razed some fifteen hundred Palestinian homes within a one-hundred-meter-wide *cordon sanitaire* (the Philadelphi corridor) between Rafah and the border and reinforced it with a seven-meter-high wall. The Mubarak regime largely acquiesced in the wall's construction, hoping it would protect his realm from a spillover of the intifada and suicide bombing that was threatening its lucrative tourist resorts along the Sinai Peninsula's riviera on the Red Sea. In addition, it feared that Israel's withdrawal risked saddling Egypt with responsibility for Gaza's 1.7 million inhabitants, disconnecting the territory from the West Bank, and thereby ending Arab aspirations for an integral Palestinian state.

In January 2006, four months after Israel completed its Gaza pullout, Hamas won the Palestinian legislative elections. Israel responded by systematically tightening its borders. On 12 March 2006, while Hamas was in negotiations to form a unity government, Israel closed Erez terminal to Gazan laborers in Israel, who once constituted 70 percent of Gaza's workforce. In June 2006, when the Israeli soldier Gilad Shalit was captured by Palestinian militants (and spirited away by tunnel), Israel shut down the Karni terminal, Gaza's primary crossing for goods (already closed for half of the previous six months). Israel also prevented the use of the Rafah terminal for passenger traffic and severely restricted access for the European monitoring mission there.[3]

Israel's array of restrictions on trade, coupled with the need to mitigate the threat of punitive Israeli airstrikes targeting the tunnel zone, quickly spurred Palestinians to develop deeper and longer tunnels spanning the width of the Israeli-bulldozed buffer and less vulnerable to sabotage.[4] The tunnel network continued to grow, and infrastructure improved. Even so, the tunnels were ill-prepared for the surge in traffic generated by the near-hermetic seal imposed on Gaza by Israel and Egypt when, in June 2007, Hamas seized control of the Strip, disbanded Fatah's forces, and chased out its leaders.

The Hamas Takeover: Blockade and Expansion

Hamas's summer 2007 military takeover of the Strip marked a turning point for the tunnel trade. The siege, already in place, was tightened. Egypt shut the Rafah terminal. Israel designated Gaza "a hostile entity" and, following a salvo of rocket-fire on its border areas in November 2007, cut food supplies by half and severed fuel imports. In January 2008, Israel announced a total blockade on fuel after rockets were fired at Sderot, banning all but seven categories of humanitarian supplies.[5] As gasoline supplies dried up, Gazans abandoned cars on the roadside and bought donkeys. Under Israeli blockade at sea and a combined Egyptian-Israeli siege on land, Gaza's humanitarian crisis loomed, threatening Hamas's rule.

The Islamists' first attempt to break the stranglehold targeted Egypt as the weaker link. In January 2008, Hamas's forces bulldozed a segment of wall at the Rafah crossing to allow hundreds of thousands of Palestinians to pour into Sinai. While long pent-up consumer demand was released, the measure provided only short-term relief. Within eleven days, Egyptian forces succeeded in herding Palestinians back. Egypt then reinforced the army contingent guarding the locked gates and built a fortified border wall. As the siege intensified, employment in Gazan manufacturing plummeted from 35,000 to 860 by mid-2008, and Gaza's gross domestic product (GDP) fell by a third in real terms from its 2005 levels (compared to a 42 percent increase in the West Bank over the same period).[6]

With access above ground barred, the Islamist movement oversaw a program of industrial-scale burrowing underground. With each tunnel costing $80,000 to $200,000 to build, mosques and charitable networks launched schemes offering unrealistically high rates of return, promoting a pyramid scheme that ended in disaster.[7] Preachers extolled commercial tunnel ventures as "resistance" activity and hailed workers killed on the job as "martyrs."[8] The National Security Forces (NSF), a PA force reconstituted by Hamas primarily with 'Izz al-Din al-Qassam Brigades (IQB) personnel, but also including several hundred (Fatah) PA defectors, [9] guarded the border, occasionally exchanging fire with the Egyptian army, while the Hamas government oversaw construction activity. Simultaneously, the Hamas-run Rafah municipality upgraded the electricity grid to power hundreds of hoists, kept Gaza's fire service on standby, and on several occasions extinguished fires in tunnels used to pump fuel.[10]As Mahmud Zahar, a Hamas Gaza leader, explained, "No electricity, no water, no food came from outside. That's why we had to build the tunnels."[11]

Private investors, including Hamas members who raised capital through their mosque networks, partnered with families straddling the border. Lawyers drafted contracts for cooperatives to build and operate commercial tunnels. The contracts detailed the number of partners (generally four to fifteen), the value of the respective shares, and the mechanism for distributing shareholder profits. A typical partnership encompassed a cross-section of Gazan society, including, for example, a porter at the Rafah land crossing, a security officer in the former PA administration, agricultural workers, university graduates, nongovernmental organization (NGO) employees, and diggers. Abu Ahmad, who had earned NIS 30–70/day as a taxi driver,[12] invested his wife's jewelry, worth $20,000, to partner with nine others in a tunnel venture. Investors could quickly recover their outlay. Fully operational, a tunnel could generate the cost of its construction in a month. With each tunnel jointly run by a partnership on each side of the border,[13] Gazan and Egyptian owners generally split earnings equally.

From enterprises primarily geared to weapons smuggling, the tunnels rapidly turned into what one trader described as "the lungs through which Gaza breathes." By the eve of Operation Cast Lead in December 2008, their number had grown to at least five hundred from a few dozen mainly factional tunnels in mid-2005;[14] tunnel trade revenue increased from an average of $30 million/year in 2005 to $36 million/month.[15] Mitigating to some extent the Gaza economy's sharp contraction resulting from the international boycott of Hamas, the PA's ongoing salary payments to some 75,000 PA employees, including some whom the PA had ordered to stop work, sustained the government's liquidity and purchasing power.[16]

Meanwhile, the area of tunnel operations doubled to eight kilometers, extending along the border from the Rafah terminal west to Tel Zagreb near the coast. So congested were some parts of the border that diggers had to burrow tunnels one on top of the other, using Google Earth to map routes and make sure they stayed on course. Teams of six laborers working round the clock in two twelve-hour shifts could dig an average of ten to fifteen meters a day. Once functional, tunnels were constantly upgraded to speed deliveries. Over time, they were fitted with internal lighting, intercoms, and generators to maintain operations during frequent power cuts. The tunnels' rough-hewn edges were smoothed to reduce damage to imports.[17]

"Legalized" by Hamas on the Gaza side of the border, the tunnels remained clandestine on Egypt's side. Thus, while in Gaza the tunnel mouths were moved from the basements of private homes to the open terrain fronting the Philadelphi corridor, in Egypt the tunnels extended deep inside Egyptian territory. Up to three-quarters of a standard eight-hundred-meter tunnel was on Egypt's side. And while the tunnel mouths, protected from the elements by white canvas, were open on the Gaza side, in Egypt they remained concealed.

FORMALIZING THE TUNNEL TRADE: REGULATION AND THE CUSTOMS REGIME

When Hamas seized the Strip from Fatah in June 2007, its military wing, the IQB, appropriated the Fatah-run tunnels, particularly those overseen by Sami Abu Samhadana, who had fled the enclave. It banned the construction of new Fatah tunnels and tightened its control over other factions operating cross-border tunnels, including Palestinian Islamic Jihad and the Popular Resistance Committees. It also set about expanding its own network, transforming the makeshift tunnels honed during the Al-Aqsa intifada into what were widely regarded as Gaza's longest, deepest, and most sophisticated. Thereafter, the IQB's domination of the tunnel traffic was undisputed.

From the outset, there was a de facto distinction between the factional tunnels, used for military and operational purposes and off-limits to government inspectors and customs authorities, and the privately owned tunnels, which were Gaza's primary source of imports. Regarding the latter, the government struggled to wrest control from the IQB. The process was slow. The IQB, owing to its victory in the June 2007 fighting against the PA, maintained control on the ground and resisted efforts by Hamas's political leadership under Ismail Haniyeh to assert its primacy. Ultimately, following a spate of violent clashes and turf battles between IQB personnel and the Executive Force—an armed contingent established by the Hamas-appointed interior minister before 2007 as a counter to the Fatah-controlled PA forces in Gaza—in which the Executive Force gained the upper hand, the Interior Ministry assumed management of the privately owned tunnels on behalf of the government.

Once in control of the commercial tunnels, the Hamas government set about formalizing the smuggling economy through regulation.[18] In the wake of Operation Cast Lead, the Interior Ministry established the Tunnel Affairs Commission (TAC) to act as the regulatory authority for commercial activities. Among its first acts was to issue a list of blacklisted imports, including weapons, alcohol, and tramadol, a painkiller much used in Gaza.[19] In response to public concern at a rising toll of tunnel casualties, particularly of child workers, the TAC issued guidelines intended to ensure safe working conditions. Over time, it fenced off the site and stationed some three hundred black-clad internal-security personnel at entry points to spot-check the documentation of persons entering and leaving the zone. Tunnel openings were patrolled on motorbike. The TAC introduced a tunnel-licensing system to prevent construction in areas deemed of national security (particularly near border fortifications where outside observation was feared, or in areas reserved for factional tunneling) and to regulate oversupply. Investors seeking clearance to build a new tunnel were required to provide proof of land ownership or notarized proof of authorization of the right to use the land. The TAC also intervened to arbitrate disputes between merchants and tunnel operators, and monitored the market for instances of sharp inflation or evidence of hoarding and price-fixing, particularly of fuel. Traders and consumers alike said they welcomed the price stabilization and removal of petty traders selling gasoline from the roadsides.

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Violations were punished. In 2009–10, for instance, the TAC closed at least five tunnels for smuggling tramadol and two for nonpayment of cigarette taxes. It destroyed an additional fifty nonoperational tunnels to prevent their use as safe houses or conduits to and from Egypt by "wanted" individuals. "We used to earn thousands smuggling small shipments of hand guns, grenades, bullets, and TNT," said a tunnel operator who first entered the business at the end of the second intifada, "but it is no longer worth the risk to be prosecuted by Hamas."[20]

In a further sign of formalization, the TAC introduced an increasingly comprehensive customs regime, providing Hamas with a new revenue base that partially compensated for the Ramallah-based PA's monopoly on customs revenues collected at Israel's ports. Haulers weighed their trucks on an electronic weigh station buried in the sand near the entrance to the tunnel zone, obtained chits for their cargoes at an adjoining hut, and upon exit presented the receipts to guards. In September 2008, the Rafah municipality introduced administrative fees, charging tunnel operators a one-time license fee of NIS 10,000 ($2,850)/tunnel and NIS 3,000 for connection to the electricity grid. Evaders were liable to tunnel closure and arrest, deferrable with a NIS 1,000 bail. Further charges were levied on heavily Egyptian-subsidized gasoline and diesel (about NIS0.5/liter in Egypt), cooking gas (NIS 30/canister), cigarettes (NIS 3/pack), and generators.[21] In addition, Gaza authorities levied a 14.5 percent value-added tax on all goods. A tunnel owner who raised a Fatah flag from his house had his license withdrawn.

Hamas's regulatory efforts did not go unchallenged, particularly after it taxed what had been a tax-free enterprise. Families and clans in the border area protested interference in their activities. In late November 2007, armed clashes erupted between Hamas government forces and members of the al-Sha'ir family in Rafah after Hamas destroyed two of its tunnels.[22] But for the most part, the rapidly expanding business opportunities available under Hamas rule trumped lingering resentments. With demand far exceeding supply, tunnel operators earned $50 for ferrying a fifty-kilogram sack through the tunnels. A decade earlier, all but 1 percent of Gaza's total imports came from, or via, Israel.[23] By the eve of Operation Cast Lead, the ratio had nearly reversed.

Although the tunnels were often rudimentary, the trade cycle was generally faster than through Israeli terminals, and less laden with customs red tape. Normal deliveries arrived within three to five days of placing an order, faster than pretakeover orders from Israel. Operators responded rapidly to demand. When Israel reduced gas supplies, smuggled canisters quickly surfaced on the market. Vaccines from Egypt entered Gaza following reports of disease sweeping chicken farms. Ahead of holidays, traders imported toys, live sheep, and fresh beef from Egypt.

Both Egypt and Israel had mixed reactions to the tunnel operations. For Israel, the reorientation of Gaza's trade to Egypt tempered the international outcry over the blockade and widened the divide between Gaza and the West Bank. For Egypt, smuggling offered copious opportunities for bribes (at both the local and national levels) from a hitherto unprofitable region. Yet both countries also saw tunnel growth as a security threat they could scarcely monitor, let alone control. Israel constantly cited the tunnels for bolstering Gaza's military capabilities. Egypt, besides worrying about the impact of spillover from Gaza's Islamist forces on its foreign currency–generating Sinai resorts,[24] reported finding weapons

A view of the tents covering entrances to underground tunnels in Rafah on the eastern side of the Egypt-Gaza border, June 2010. (Eman Mohammed/Getty Images)

stockpiles near the border.[25] In an effort to interrupt the traffic, Israel repeatedly deployed drones and manned aircraft to bomb Gaza's tunnels,[26] while Egypt stepped up tunnel detection and demolition. Tunnel owners responded by improving their design and digging to depths of over twenty-five meters.

Operation Cast Lead and Its Aftermath

Israel's repeated attacks on Gaza culminated in the devastating Operation Cast Lead of winter 2008–9. Although Hamas's detractors in Gaza claimed the tunnels served as an escape hatch for some senior Hamas officials during the war, aerial bombardment of the Rafah border severely damaged the network, resulting in a temporary suspension of commercial traffic.[27] Meanwhile, the land, air, and sea blockade remained fully in force.

As part of the internationally brokered ceasefire, Israel secured U.S. agreement to act against the smuggling routes supplying Gaza. The agreement was reinforced weeks later at a gathering in Copenhagen on 5 February 2009 of officials from the United States and several European countries focused on international naval patrols in the Red Sea and aerial surveillance of Sudan. Separately, Egypt committed to build (under U.S. military supervision) a twenty-five-meter deep underground steel barrier along its border with Gaza aimed at blocking the tunnels within a year.[28]

By the end of 2010, it claimed to have sabotaged some six hundred tunnels by various means, including plugging entrances with solid waste, sand, or explosives, and flooding passages with sewage.[29] Use of tear gas and other crowd-control techniques inside the tunnels resulted in several deaths.[30] "The war marked a turning point in how Egypt's security dealt with us," remarked one tunnel operator. "In the past, they would look the other way when a lorry stopped to unload at a tunnel mouth, but since May 2009 they . . . raid the homes, sheds, farms, and shops of our Sinai suppliers."[31]

That said, Egypt's countermeasures never quite matched its policy statements. From the first, Egypt cited logistical problems such as difficulties hammering steel plates more than four meters deep in stony ground.[32] Tunnel operators cut through completed segments with blow torches, nullifying the multimillion dollar project for the cost of a few thousand dollars.[33] Reluctance to forgo the bribes accruing from smuggling further compromised official resolve.[34] Egyptian security forces often targeted the shallowest and most easily detected tunnels, leaving the more developed and profitable ones untouched. Tellingly, construction slowed where tunnel activity was most concentrated. Hamas's success in mounting a solidarity network to condemn the Mubarak regime for enforcing the siege further eroded Egypt's political will. Frustrated, the U.S. Congress suspended technical support for the underground steel barrier in mid-2011.[35]

Motivated by family and clan unification, as well as economic benefits, Bedouin and Palestinians on Egypt's side of the border also resisted Egypt's security measures. "We're Palestinians working for the sake of Palestine," said a tunnel laborer in Egyptian Rafah.[36] To foil Egyptian security, Bedouin operators sometimes tapped into well-armed clan defense committees versed in Sinai's topography from centuries of roaming. There were sporadic reports of clashes between Bedouin irregulars and Egyptian forces seizing contraband.[37]

Tunnel Expansion and Postwar Reconstruction

Meanwhile, the ceasefire at the end of Operation Cast Lead enabled Hamas to undertake repairs on the partially destroyed tunnels and to oversee a major overhaul of the complex, even reducing taxes to stimulate the work.[38] Fear of Egyptian detection prompted operators to extend their tunnels to a length of one and a half kilometers and to deepen them to up to forty meters below ground. Operators reinforced tunnels first with wooden planks, then cement blocks and metal to allow sufficient widening for raw materials to pass through without risking tunnel collapse. Rope ladders flung down the shafts were replaced by electric elevators, while the four-meter-long sledges (*shahata)* pulled by winches were replaced by carts running on rails, much as in coal mines.

Within two years, capacity had increased tenfold. By late 2010, large commercial tunnels were estimated to be shifting up to 170 metric tons of raw materials each per day. The number of tunnels transporting livestock rose from three in 2008 to at least thirty in mid-2010. There was also less loss and damage, since the longer tunnels were harder for Egypt's security to find, and conditions inside the tunnels had substantially improved. Economies of scale and diversified sources of supply lowered costs. By the summer of 2011, 60 percent of traders reported that prices had fallen to equal or below the presiege level for goods from Israel.[39] For example, a liter of fuel (initially sold in sand-riddled plastic soda bottles) cost four times more than in Israel in 2008; by 2009 fuel (pumped through three-quarter-inch pipes at a rate of 20,000 liters/hour) sold at a quarter of Israel's price. By mid-2011, prices for Turkish cement (Gazans snub Egypt's lower-quality products) had plummeted from $1,500/ton at the height of the closures in mid-2008 to the presiege price of $100. The cost of shipping a fifty-kilogram sack of goods fell from $50 to $5. "There are at least 1,500 underground tunnels now," said an owner. "Most are bigger and better than ever before, and all of them are open for business. The result is more competition, more price wars, and less work for everyone."[40]

Demand grew as capacity improved and prices fell to within a range average Gazans could afford. Between 2008 and 2010, traders of household goods reported a 60 percent rise in their import of goods via the tunnels. By mid-2010, Gaza's retailers reported that shortages resulting from Israeli restrictions had been reduced "to a reasonable extent or more."[41] Wholesalers rapidly replenished their empty warehouses. By mid-2009, cars—hitherto cut into three and welded together in Gaza—were arriving whole, first dragged through the tunnels by bulldozers and then driven through expanded tunnels. To satisfy demand, tunnel operators tapped into contraband, particularly of cars, arriving from Libya after Qaddafi's retreat from Cyrenaica left his arms depots and ports open for looting.

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Expansion also facilitated the import of inputs and raw materials, precipitating what has been perhaps the tunnels' greatest achievement: kick-starting Gaza's postwar reconstruction while donors remained on the sidelines. While world leaders promised billions at showcase conferences in Sharm al-Sheikh's luxury hotels but failed to persuade Israel to lift its ban on construction materials, the tunnels enabled Gazans to rebuild their enclave themselves. In the immediate aftermath of Operation Cast Lead, while operators were still repairing their tunnels, Gazans made their own gravel by pummeling war wreckage. The two most visible symbols of Israel's short-lived cooperation with the Palestinians post-Oslo—the shell-shattered Erez industrial park on Gaza's northern border, and the destroyed European Union–funded airport in the south—were reduced to sandpits. Once the tunnels were upgraded, operators began moving heavy materials. By mid-2011, three thousand tons of gravel, five hundred tons of steel rods, and three thousand tons of cement were arriving daily.

Gaza morphed into a construction site. Roadsides were piled high with building materials from Egypt. According to the World Bank, construction starts in the first half of 2011 grew by 220 percent. UN Habitat estimated that, based on the materials allowed in by Israel, it would take eighty years to rebuild the six thousand housing units destroyed in Operation Cast Lead and accomodate the growth in population over five years of closure; tunnel flows reduced that lagtime to a more manageable five.[42] Indeed so rapid was the pace of construction that by mid-2012 real-estate agents reported that they were struggling to locate prospective buyers for the new apartments.

It was not only Gaza's housing stock that began to recover. Farmers resorted to tunnel imports to circumvent Israel's ban on seeds, pesticides, irrigation pipes, and basic agricultural tools such as hoes and buckets. The increased affordability of inputs helped factories resume operations: Hamas officials claimed that by October 2011, half the fourteen hundred factories destroyed during Operation Cast Lead were back in production.[43] A food-processing plant resumed operations after items banned by Israel—including preservatives, plastic wrapping and packaging made in Egypt, and spare parts—arrived from Switzerland via tunnel.

All told, the tunnel expansion precipitated a recovery that rapidly reversed much of Gaza's earlier decline. From 2005 to 2009, Gaza's per capita GDP contracted by 39 percent in real terms, with the tunnels providing at best limited relief.[44] After Operation Cast Lead, the tunnels facilitated what a September 2011 World Bank report described as "exceptionally high growth," notching 28 percent in the first half of 2011.[45] Unemployment dropped from 45 percent before Operation Cast Lead to 32 percent by mid-2011.[46] Rafah's markets bristled with shoppers and café-goers late into the night, its backstreet ATMs distributing $100 bills.

THE LIMITS AND LIMITATIONS OF THE TUNNEL-DRIVEN RECOVERY

Even as the World Bank was touting Gaza's exceptional growth, however, the structural flaws impeding Gaza's full-fledged reconstruction persisted. With few exports capable of generating sustainable growth, Gaza's consumption was capped. By 2010, the markets were saturated, with improved supply lines outstripping demand, while wages fell sharply, not least due to increased use of cheaper Egyptian labor.[47] Intense competition pushed tunnel earnings and prices down even faster. With supply already exceeding demand, Israel's June 2010 decision to lift its ban on the import of commercial goods (following the international outcry over the *Mavi Marmara* aid-flotilla incident) triggered a market glut. Retailers hitherto limited to imports via the tunnels revived their former ties with Israeli counterparts.[48]

By the end of 2010, operations at over half of Gaza's eleven hundred tunnels had reportedly been suspended.[49] Those that survived launched efficiency drives, reducing operating hours and cutting labor so as to remain commercially viable. Increasingly, tunnel activity narrowed to goods that were competitive because Israel either heavily taxed alternatives, such as fuel, or banned them. The latter included most raw materials, all items defined as "dual use" (e.g., construction materials, machinery, chemicals, and spare parts), and almost all export goods. "Israel's blacklist is the smugglers' green list," commented a prominent Gaza businessman who imports Egyptian cacti for his nursery through the tunnels.[50]

By spring 2012, signs that the economy had reached the ceiling achievable through the tunnel conduits were increasingly visible. According to figures from the Palestinian Central Bureau of Statistics for the first quarter of 2012, unemployment had begun to climb, and the previous high rates of growth had fallen back sharply. Despite Egypt's acquiescence to increased passage through the Rafah terminal, most of Gaza's 240,000 refugee youth have never left the enclave, and 51 percent of them remain unemployed.[51] Continued restrictions by the Egyptian authorities on the entry of tanker trucks bound for Gaza into the Sinai Peninsula left the enclave in darkness for much of the night. Israeli warships cruise on the horizon, a visible reminder of the three-mile limit Israel has imposed on Gaza's seas. The claustrophobic feeling of being trapped by land, air, and sea has not disappeared.

Initially in the wake of Mubarak's ouster, the tunnel economy enjoyed a boom. As the internal-security apparatus took flight, Egypt's remaining impediments disappeared. Tunnel mouths placed deep inside Egyptian territory resurfaced close to the border, in the process taking an obvious toll on Egyptian Rafah's housing stock, where gaping cracks appeared even in recent construction. Construction on the underground steel barrier was formally halted.[52] Tunnel owners reported next to no impounding of materials, only token destruction of tunnel mouths, and a marked decrease in demands for bribes. Many Egyptian operators who had been sentenced in absentia and who had paid hefty bribes to avoid arrest were granted amnesty.[53] Heightened domestic opposition in Egypt to the ongoing Gaza blockade and increased activity by Bedouin armed groups offered tunnel traffickers additional protection.

In deference to Cairo, Hamas had from the start banned the use of commercial tunnels for passenger traffic, but reversed this policy after the Mubarak regime fell. Meanwhile, the new Egyptian authorities, with much fanfare, eased the restrictions on passage through the Rafah terminal. However, with restrictions still in place,[54] the tunnels offered a viable fast track that circumvented much of the red tape of the overland crossing.[55] To regulate passenger traffic, the TAC introduced a system of prior coordination that took two days rather than the two months required for applications to cross via the Rafah terminal. Moreover, while the Rafah crossing closed at 5:00 P.M. (later extended to 8:00 P.M.), the tunnels operated around the clock. Male applicants ages 15–40, some 35 percent of whom were generally barred entry to Egypt on security grounds, benefited in particular, but all kinds of travelers, from Pakistani academics and Palestinian workers fleeing Libya to families on holiday, used the tunnel. Costs for the two-hundred-yard crossing, which previously reached hundreds of dollars, fell to NIS 100 ($30).[56]

Relaxed controls also served to alleviate the ban on exports, the other grueling aspect of the siege.[57] These included scrap metal (smelted in Sinai and reimported as steel rods for construction and possibly also military use),[58] dapple racing horses (which all but disappeared from Gaza due to high Egyptian demand), ammunition (which spiked in demand during Egypt's 2011 revolution), and surplus produce—watermelons, apples, and eggs—resulting from Gaza's drive for food self-sufficiency.[59] That said, Egypt's lower labor costs and purchasing power rendered most Gaza produce uncompetitive, and Gaza's manufacturing base, traditionally geared to the Israeli and West Bank markets, was slow to adapt to Egyptian needs.[60] Egypt-bound traffic comprised mainly reexports of goods from Israel for which there was Egyptian demand, including heavily taxed items such as shoes, hair gel, and mobile phones.[61]

Yet ironically, Mubarak's ouster in February 2011 could yet spell the collapse of the tunnel economy. Led by Hamas leaders, Gazans look to Egypt's new Islamist leadership to dismantle the siege structures and open the crossing to overland goods traffic. Certainly, initial euphoria at the prospect of a new laissez-faire era in Egyptian-Gaza relations dimmed as Egypt's ruling military council, the Supreme Council of the Armed Forces (SCAF), consolidated its hold. In a sign of renewed leverage over Gaza, and reflecting a desire to cut their subsidy bill,[62] the Egyptian authorities blocked tanker trucks en route to Gaza hauling heavily subsidized Egyptian gasoline. Although some fuel continued to trickle through the tunnels, the enclave again experienced outages of up to eighteen hours per day, as in the harshest days of the siege. The shortages not only rendered life uncomfortable, they deprived it of the dynamo to power more reconstruction. Inside Gaza, the Hamas government faced widespread charges of hubris for wildly overestimating the early benefits accruing from the Arab awakening. With Gaza's fate increasingly intertwined with Egypt's, the dominance of the military government, along with the Muslim Brotherhood's focus on domestic affairs, cast a pall over the prospects for Gaza's trade ties with Egypt.

WINNERS AND LOSERS

Five years of Hamas rule over Gaza and sponsorship of the tunnel trade brought changes to the Strip whose impact could be felt at a popular level. Public infrastructure—including the parliament and other government buildings, police stations, and mosques—had been leveled or severely damaged in Israel's Operation Cast Lead bombardment. The Hamas government, armed with the proceeds from import taxes and an expanded tunnel infrastructure capable of transporting heavy goods and machinery, repaired and upgraded infrastructure. Hamas also widened the Salah al-Din Road (the Rafah-Gaza City highway) to accommodate increased traffic from the south, and, in Gaza City itself, began beautifying prominent landmarks, sodding sandy areas, dredging the port, installing traffic lights, and rebuilding its coastal riviera to the south, which officials claimed would one day rival Tel Aviv's.

In an economy blighted by unemployment resulting from Israel's ban on Gazan workers, the bombardment of its manufacturing base, and the closure of export markets (above and beyond a significant slowdown in donor-funded development projects), the tunnels emerged as Gaza's largest nongovernmental employer. The tunnel industry attracted construction workers once employed in Israel from across the Gaza Strip. For a time, tunnel workers were the best paid in Gaza: in 2008, the average daily wage was $75, five times Gaza's median wage according to official Palestinian figures, and more than West Bank Palestinians earned building Israel's Jewish settlements.[63] The tunnel trade was also the largest overall employer of youth. School dropouts scrounging NIS 20/day as street peddlers earned ten times that much in the tunnels. Although market saturation and recourse to Egyptian labor later depressed daily wages to more like NIS 80, even this was quadruple a farmhand's wage. With each fully functioning tunnel employing twenty to thirty people, by 2010 the tunnel industry was estimated to employ some five thousand tunnel owners and twenty-five thousand workers, supporting about one hundred and fifty thousand dependents, or 10 percent of Gaza's population.[64]

Such was the turnaround in the local economy that Gaza City had a surfeit of new hotels, restaurants, and beach cafés, which attracted not only the new moneyed elite the tunnels had fostered but also exiles returning to the Strip (sometimes via tunnels), and even visitors from northern Sinai.[65] Gaza's new luxury hotel, al-Mashtal, optimistically bought cocktail glasses, while visiting businessmen from the West Bank complained that the latest-model sports cars and Hummers could be seen on Gaza's streets long before they surfaced in Ramallah. Real-estate brokers said the multiplier effect of the increased spending power spurred a threefold increase in real-estate prices.[66]

That said, Gaza's macroeconomic growth figures disguised wide disparities in the distribution of the new wealth. In geographical terms, prosperity followed the new employment opportunities: the north languished, while the south boomed. Bayt Hanun, once Gaza's gateway to Israel, sank into depression, while Rafah, hitherto the enclave's most depressed city, boomed. Unemployment in Rafah fell from about 50 percent on the eve of the Hamas takeover to 20 percent by December 2008.[67] Trade experienced similar shifts. As established trading routes via the Israeli port of Ashdod waned, Gaza's commercial ties with Egypt revived after a forty-year hiatus. Gaza's traditional mercantile elite, which had developed ties with Israeli and Western European suppliers, found its status and influence in Gaza increasingly sapped by a new generation of smugglers tapping into ancient informal trade routes that extended southward into Sudan, and who quickly diversified their supply sources to include Egyptian, Chinese, and Turkish suppliers.[68] And while yesterday's commercial elite excelled in foreign languages acquired through travel and education, the new bourgeoisie of smugglers was less educated but had the benefit of cross-border clan connections and the backing of Gaza's Islamist rulers. Thus, the tunnels became a key driver of upward mobility and social change, empowering previously marginalized groups and spawning a class of nouveaux riches.

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Further encroaching on traditional business elites, tunnel owners used their financial clout to diversify upstream into retail, developing their own networks of agents to increase their market hold. Spared the cost of tunnel fees and privy to market information gained from hauling goods, they undercut retail prices, prioritized their own goods over wholesaler deliveries, and even distributed their own catalogues direct to consumers. On occasion they flooded the market to suppress prices and push wholesalers to the point of collapse. "No matter what we do, we cannot compete with the tunnel owners. They have decreased our income by 70 percent at least," complained Ala' Abu Halima, a long-standing Gaza merchant specializing in agricultural inputs.[69]

Western-backed NGOs and the United Nations, whose required funding criteria barred them from purchasing smuggled goods and therefore stymied their reconstruction efforts, vociferously campaigned to end Israel's siege. UN officials noted the paradox whereby U.S.-led financial restrictions, which prohibited the United Nations from accessing tunnel supplies, gave their supposed target, Hamas, a distinct advantage. Refugee families turned increasingly to Hamas rather than depend on the United Nations Relief and Works Agency (UNRWA), the organization charged with sheltering them (and three-quarters of the Strip's population). UN Special Coordinator for the Middle East Peace Process Robert Serry, fearing that the international community was hemorrhaging influence, complained in a May 2010 briefing to the Security Council that "the flourishing illegitimate tunnel trade permits smugglers and militants to control commerce," while "international agencies and local contractors who wish to procure goods entering through legitimate crossings too often stand idle due to the Israeli closure." Even following Israel's declared relaxation on the import of construction materials for international projects in Gaza beginning in early 2011, the mandatory submission of all projects for Israeli approval has resulted in a process UN officials describe as "slow, cumbersome and costly"[70]—and often uncompetitive vis-à-vis contractors supplied with goods from the tunnels.

The Bedouin population near the Egypt-Gaza border also profited greatly from tunnel commerce, especially the main clans: the Sawarka, Ramailat, and Tarabin. Proceeds from the tunnels were used not only to erect mansions but also to arm Bedouin defense committees. "A decade ago, my whole clan had three cars. Nowadays each household does," says a Bedouin trader in Rafah.[71] Families and clans separated for years by the border socialized in Gaza's new restaurants. In a sign of the growing social and economic interaction between Gaza and Sinai, some Palestinian businessmen laundered their tunnel profits by investing in property in and around El-Arish, prompting a spike in land prices. Allegations abound that Gazans were seeking to export not only their earnings but also their arsenals to Sinai for safekeeping. At the same time, disparities between the economic prospects of Sinai's clans bordering Gaza and those bordering Israel mounted, heightening friction between them. Israel's construction of a 240-kilometer wall along its border aimed at severing smuggling routes to Israel only heightened the tensions. The rapid decline of Sinai's formal economy of tourism along the Red Sea plummeted, fueling animosities which on occasion turned violent. Adding to the instability, some Bedouin, reined in by Hamas in Gaza, crossed via tunnel to pursue their blood feuds in Sinai.[72]

Hamas and the Tunnels

The underground lifeline for Gaza's population was no less a salvation for the Hamas government, which struggled to survive efforts by multiple foes to engineer its collapse or stoke social unrest by means of a siege. Over time, the tunnels enabled Hamas to consolidate its hold on the Strip and to circumvent U.S.-led international financial restrictions.[73] According to banking sources, the TAC raised $150–$200 million in revenues in 2009, a figure that continued to climb in 2010 as the tunnel traffic grew, but then tapered off after Israel relaxed its closure and Egypt restricted fuel bound for Gaza.[74] As a result, Hamas became increasingly immune to the financial leverage both of the international community and—significantly—its own Damascus-based leadership.

As noted above, the government increasingly consolidated its hold on revenues over time. Following the 2007 takeover of the Strip, the

Interior Ministry reasserted Hamas government control over the commercial tunnels in place of the IQB. From then on, the ministry not only regulated the tunnels but also took charge of collecting the tunnel revenues, depositing them directly into its own account to cover its budgetary expenditures. While any excess funds were transferred to the central government, other ministers grumbled that the Interior Ministry's prior claim on tax receipts was less than satisfactory.

In 2011 the government, with support from the Hamas movement and the Palestinian Legislative Council, reached an agreement whereby the ministry would deposit all receipts into a single treasury account but would be given priority in disbursements.[75] With the situation thus regularized, National Economy Minister 'Ala' Rif'ati was able, soon after his appointment in 2011, to post two hundred customs and excise officers to the tunnel enclave alongside Interior Ministry employees to enforce levies.[76]

Through its growing tax base, Hamas increased its economic independence from Israel and the PA, although the latter continued to make salary payments to the some seventy thousand employees on its payroll. Hamas even made some progress delivering on its 2006 campaign promise to free Gaza from Oslo's 1994 Paris Protocol, which gave Israel virtually full control over the Palestinian economy.[77] The development of direct trade ties with Egypt also enhanced Hamas's ideological vision of fostering ties with the Islamic world and downgrading relations with Israel. According to a Hamas official, "The siege is a blessing in disguise. It is weaning us off of Israel and sixty years of aid, and helping us to help ourselves."[78]

Armed with resources to govern from the tunnel proceeds, Hamas transformed itself from a nonstate actor with a social and charitable network, underground movement, and guerrilla force into a governing authority with a well-equipped internal security force, bureaucracy, and economy. The commercial tunnels and the Sinai population's growing economic dependence on trade with Gaza gave Hamas the soft power to project its influence into the Sinai Peninsula, even as the factional tunnels enabled its military wing to augment this "soft" influence by exercising its own leverage there. Overall, the eclipse (at least temporarily) of Egypt's internal security force in the peninsula and the simultaneous increase in Gaza's military capabilities—combined with Gaza's economic, social, and cultural pull—led observers close to Hamas to describe the movement as gaining strategic depth inside Egypt's periphery. If indeed the enclave emerges as a regional center of gravity, all parties hoping to establish stability in the Sinai will have to take it into account.

That said, the tunnel economy has also tarnished Hamas's reputation for transparency, accountability, and financial propriety. "This is not the old style radical movement," notes a Gaza economist; "Hamas has acquired a business venture."[79] The Hamas authorities were widely criticized from the outset for making tunnel licenses conditional on appointing its members to the boards of tunnel cooperatives, often on preferential terms. The government's decision to wash its hands of the pyramid scheme for tunnel investment mentioned earlier, which had been endorsed by prominent Hamas preachers and had left numerous investors bereft of their savings, marked the first major dent in its domestic credibility. Thereafter, Islamist and secular opponents alike adopted the discourse of corruption that Hamas had hitherto used to undermine Fatah. Some elements of the IQB, meanwhile, acquired a reputation for profiteering much like that associated with Muhammad Dahlan's Preventative Security Forces that preceded them, dispensing with the resistance activities that were once their hallmark. Several prominent officials, including Hamas spokesman Fawzi Barhum, come from families with strong ties to the tunnel economy and were viewed as protecting their tunnel holdings. A Salafi jihadi from Gaza's Middle Areas expressed it thus:

> Before entering government, Hamas acolytes focused on religious sermons and memorizing Qur'an. Now they are most interested in money, tunnel business and fraud. Hamas used to talk about paradise, but now they think about buying land, cars and apartments. After the evening prayers, they would go to study, now the Imam looks at ways to make money. Before they prayed in the mosque, now they pray at home.[80]

Hamas's lack of transparency about its use of its tunnel earnings compounds suspicions. While Hamas officials say local revenues comprise half the government's $750 million annual budget for 2011,[81] local businessmen calculate the earnings to be considerably higher, raising questions about where the funds go and why there are repeated shortfalls in monthly civil-service salary payments.[82] Calls for accountability have mounted as the Haniyeh government has increased the tax burden. (National Economy Minister 'Ala' Rif'ati, who upon taking office called for Gaza's withdrawal from the Paris Protocol to spare the population Israeli-level tariffs, four months later declared his intention to raise tariffs in line with Paris Protocol rates.[83])

A similarly cavalier approach to child labor and tunnel fatalities damaged the movement's standing with human-rights groups, despite government assurances dating back to 2008 that it was considering curbs.[84] During a police patrol that the author was permitted to accompany in December 2011, nothing was done to impede the use of children in the tunnels, where, much as in Victorian coal mines, they are prized for their nimble bodies. At least 160 children have been killed in the tunnels, according to Hamas officials.[85] Safety controls on imports appear similarly lax, although the TAC insists that a sixteen-man contingent carries out sporadic spot-checks.[86]

All told, the tunnels have been a mixed bag for Hamas. While its detractors praise—albeit begrudgingly—its success in reducing the impact of Israel's stranglehold, perceptions of corruption inside the organization have intensified. During the renewed fuel shortages of spring 2012, there were widespread allegations that Hamas leaders received uninterrupted electricity and that gasoline stations continued to operate for the exclusive use of Hamas members. True or not, they fed a growing mood of recrimination that Hamas had profited from the siege.

FUTURE PROSPECTS

While the tunnels have spared Gaza's economy from collapse and made possible some reconstruction, concerns that their utility might have peaked are rife. Despite the construction boom, the tunnels have not equipped Gaza with the tools required to rebuild and sustain a productive society. The manufacturing base remains hobbled by the ongoing ban on exports.[87] Once its housing stock is restored, Gazans ask, what then? Where will the workers go? Tunnels were always a remedial answer to the blockade, not an economic solution. The high costs of food and other aid, ultimately borne by international donors and passed on to their taxpayers, can only be avoided when the border opens to normal commercial trade for both imports and exports.

To date, Gaza's mercantile elite and foreign donors have looked to intra-Palestinian reconciliation and the reestablishment of PA control inside Gaza to end Israel's five-year blockade. But even in the most favorable of circumstances, it is hard to see how trade and labor markets can return to their pre-2000 highs. Despite significant improvement following Operation Cast Lead, truckload entries in February 2012 represented less than half the average 2005 monthly entry of 10,400 trucks.[88] Moreover, even if Israel fully opened its crossings, tunnel operators might continue to enjoy some inbuilt advantages over formal trade, including the ability to smuggle subsidized Egyptian produce and the absence of red tape. As long as Gaza is vulnerable to the vagaries of Israel's use of economic tools to cajole Gaza's rulers, the tunnels will likely remain a strategically important safety valve and back door.

For its part, Hamas continues to look southward to Egypt. Its hopes of capitalizing on the rise of its parent and sister movements in North Africa have so far failed to materialize. Travel to and trade with Egypt are certainly easier, but with goods still transported underground, the enclave remains psychologically and physically under siege. Despite the election of a senior Muslim Brotherhood official as the new Egyptian president, Egypt's military apparatus retains, at least for now, control over the country's security and borders. High-level intelligence officers continue to view Gaza's Islamist leaders as a threat to national security and have used restrictions on the entry of goods—particularly fuel—into Sinai in an attempt to bring them to heel. How the power struggle between President Muhammad al-Mursi and the SCAF plays out will be critical to determining the extent to which Egypt and Gaza can normalize their political and trade relations and end Gaza's state of siege. While Mursi's election was greeted ecstatically by Hamas's rank-and-file, a sober realism and even hint of frustration at the tweaks to existing Egyptian policy rather than an overhaul continues to mark the statements of some Hamas officials.

That said, there are pointers that keep the hope of a sea change in ties with Egypt and the broader region alive. In February 2012, North Sinai's Chamber of Commerce was the first official trade delegation to visit Gaza since the Hamas takeover in 2007. Others have followed, holding out the prospect that trade already legalized in Gaza could become so in Egypt as well. Ironically, any attempt to legalize trade above ground would likely result in both governments rendering the tunnels illegal and taking steps to terminate smuggling. Both governments have already discussed bringing the underground economy to the surface, opening the Rafah terminal to trade, and opening a free-trade zone straddling the Egypt-Gaza border.[89] Gazan businessmen, together with counterparts from Ismailia's Chamber of Commerce, have since formed the Egypt-Palestine Company, aimed at establishing a 1,000 dunam free-trade zone. Egyptian officials suggest that the resulting trade could reach $2 billion annually, more than doubling current bilateral trade and surpassing the country's U.S. military aid. In an attempt to show a cooperative spirit, Hamas returned five stolen cars to Egypt and pledged to stop (temporarily) the unlicensed import of cars.[90]

Though small and reversible, such steps have kept alive a vision of Gaza's exit from its pariah status and integration into the region's emerging new order. In February 2012, Hamas announced agreements in principle with Egypt's petroleum and energy ministries to link Gaza to Egypt's electricity grid and gas pipelines, with the assistance of a $70 million loan from the Islamic Development Bank. Though subsequently overturned by SCAF, these agreements offer a pointer of how relations could evolve. Hamas ministers have drawn up plans to link Gaza to the region's labor and export markets as well as its transport system. "Within two years, you'll be able to take the bus all the way from Gaza to Morocco," predicts Hamas Agriculture Minister Mahmud al-Agha.[91] Others speak of reviving the old railway that ran from Cairo through Gaza. Ismail Haniyeh's recent audience with President Mursi resulted in what Palestinians said were a series of Egyptian commitments to increase passenger traffic through Rafah and fuel supplies.

Winding down the tunnel trade could provoke clashes with key vested interests both within the movement and without, particularly in the Sinai Peninsula. The tunnels have fostered common interests between Sinai's Bedouin traders, transporters, and tunnel owners and Gaza's consumers, which will not be easily decoupled. But the benefits of winding down would be considerable. Stemming smuggling would strengthen Hamas's preelectoral claims to promote good governance and counter corruption, and possibly would revive tourism.[92] Indeed, Gaza's rulers have committed to closing the tunnels in the event Egypt's opens its border for formal overland trade.[93] For Egypt, too, there would be benefits in overland trade, for the tunnels, a key component of the country's black economy, have been a driver of corruption of state officials, encouraged the proliferation of weapons, and strengthened Sinai's centrifugal forces. In short, while the tunnels have served as the homemade driver of Gaza's reconnection to the region, the final realization of this goal can best be served by their demise.

ENDNOTES

1. Where not cited, figures and interviews in the article are derived from an unpublished study conducted on behalf of the United Nations Development Program during 2010, which this writer helped author. The findings were drawn from interviews with over five hundred Gazans involved in tunnel-related activity conducted in the month prior to the flotilla crisis of 31 May 2010.

2. Between September 2000 and May 2004, Israel's military claimed to have destroyed ninety tunnel mouths.

3. The UN Office for the Coordination of Humanitarian Affairs (OCHA) reported that up to 15 November 2006, Karni had been closed for 54 percent of scheduled days in 2006, compared to only 18 percent and 19 percent in 2004 and 2005, respectively, with an average of only twelve trucks per day, compared to the Agreement on Movement and Access (AMA) target of at least 150 by December 2005 and 400 by year-end 2006. As a result, only 4 percent of the 2005–6 harvest was exported, 24 percent was sold locally, and the rest had to be donated or destroyed. UN OCHA, *The Agreement on Movement and Access One Year On*, November 2006, p. 3. For further background, see UN OCHA, "Implementation of the Agreement on Movement and Access," Report No. 39, 30 May 2007.

4. Interviews, Palestinian and Israeli security experts, Gaza and Jerusalem, June 2010. See Mohammed Omer, "Gaza: The Economics of Tunnels," *Washington Report on Middle East Affairs*, 10 February 2009.

5. The seven were wheat, flour, rice, sugar, vegetable oil, dairy products, and legumes. The number of truckloads entering Gaza fell from 12,000/month on the eve of disengagement to 7,000/month following Shalit's capture a year later to a mere 2,000 in November 2007. After Hamas's takeover, the number of trucks sometimes dropped to twenty per day, whereas Gaza's needs were estimated at over 1,000 trucks/day. "Israeli-controlled passages supplied Gaza with less than 10 percent of the imports needed for normal economic activity." Yitzhak Gal, "The Gates of Gaza and the Economic Power of Hamas," *Middle East Economy*, Moshe Dayan Center for Middle Eastern and African Affairs, Tel Aviv University, 3 June 2011.

6. World Bank, "Palestinian Economic Prospects: Gaza Recovery and West Bank Revival," Economic Monitoring Report to the Ad-Hoc Liaison Monitoring Group, June 2009.

7. The scheme, launched in summer 2008 by Hamas brokers and preachers based in Bureij refugee camp, attracted Gazans with rates of between 30 and 50 percent per month. Fund managers initially met their promises by paying out of deposits until the tunnels came under heavy bombardment during Operation Cast Lead. As investors rushed to withdraw savings, the scheme collapsed, and key brokers either fled to Egypt or were placed under house arrest. Amid widespread

protest, the Hamas government offered to reimburse investors 16 percent of the capital as a first installment. No subsequent payouts were reported. An investigation by the Gaza legislature's monitoring and human rights committee reported that Gazans had invested $400 million in the scheme by the time it collapsed. Interview, Palestinian Legislative Council (PLC) committee member, Gaza City, October 2009.

8. Gaza's authorities have encouraged tunnel operators to provide rudimentary life insurance policies for tunnel workers. They recommend payment of at least $11,000 for families of married workers killed in the tunnels and $9,000 for the families of unmarried workers, as well as full coverage of funeral and wake costs.

9. The most senior defector was Colonel Hussein Abu Azerah, a commander of the NSF's 3d Brigade, who was appointed as overall commander of the new NSF. A Bedouin from Rafah, he had extensive family and clan links with smuggling rings in the Sinai, and was entrusted with bringing smuggling operations on the Gaza side of the border under Hamas control.

10. UN briefing, 7 May 2010.

11. Interview, Gaza City, June 2010.

12. In June 2007, a U.S. dollar was worth 4.2 shekels.

13. Owners on the Egyptian side fell into three main categories: Egyptians of Palestinian origin with relatives in Rafah, Sinai Bedouins renting land in Rafah, and Egyptians living in Rafah. Interviews, Rafah (Egyptian side), June 2011.

14. Interview, tunnel operator, Rafah (Egyptian side), June 2011.

15. Ziad Jarghoun, Popular Front for the Liberation of Palestine Central Committee member, *Al Malaf*, 13 December 2008. Others valued the trade at $650 million. Ghazi Surani, *Al-Hiwar Al-Mutamadin*, Issue 2495, 14 December 2008, http://www.ahewar.org/debat/show.art.asp?aid=156356.

16. The Fayyad government continues to funnel $65 million in monthly salary subventions to the PA's former workforce in Gaza, and the UN to pay over ten thousand UN local staff. Economists estimate the PA budgets for some $1.5 billion of annual expenditures in Gaza, including payments for health and education. Interview, Ali Abu Shahla, secretary-general of the Palestinian Businessmen Association, Gaza City, May 2012.

17. Traders reported that 20 percent of tunnel consignments arrived spoiled, lost, or stolen, adding on average 12 percent to the retail price.

18. Hamas officials claim to control the entire tunnel operation except the section east of Rafah terminal inside Israel's self-declared buffer zone, extending across the grounds of the former airport. When Hamas monitors approach, they say, smugglers operating outside Hamas control open fire on Israel, prompting Israel to shoot back and chase the monitors away.

19. Other banned traffic included people and disassembled vehicles. Interview, head of the Border Commission, Gaza, July 2010. Despite the controls, all the aforementioned continued to enter. A bottle of whiskey traded for NIS 800/bottle.

20. Interview, Khaled, age 27, tunnel owner, Rafah, April 2010.

21. Civil Defense, a branch of Hamas's security forces responsible for emergencies, imposed a NIS 50 tax to cover the cost of sending the fire service to tackle blowouts.

22. Interview, Palestinian observer, Rafah, November 2007.

23. U.S. Department of State, "Low-Level Egyptian-Palestinian Trade in 1997: The Year in Review at Rafah, According to Israeli Statistics," unclassified cable, Tel Aviv 01186, January 1998, cited Sara Roy, "De-development Revisited: Palestinian Economy and Society Since Oslo," *Journal of Palestine Studies* 28, no. 3 (Spring 1999), pp. 64-82.

24. *Al-Youm al-Saba*, 29 December 2009.

25. *Al-Youm al-Saba*, 12 May 2010.

26. From 2006 to 2009, at least seven people were killed in Israeli airstrikes on the tunnels and more than 250 injured. Al-Mezan Centre for Human Rights, Gaza, 2 November 2009.

27. One third of the forty-eight targets Israel's armed forces struck inside Gaza in the first half of 2010 were tunnels. *Yedi'ot Aharonot*, 1 July 2010.

28. Palestinian Information Center, (pro-Hamas website), 6 June 2010.

29. Maan News, 19 October 2010.

30. "Last week four boys were gassed in the tunnels. The Egyptian police just closed the escape hatch, and left them to suffocate." Interview, Mazen Abu Amarneh, Hamas official, Rafah, May 2010. "The Egyptian police suddenly raided one of the tunnels I was in and poured a noxious liquid inside. I was badly burnt and couldn't work for three months." Interview, tunnel worker, age 20, Rafah, April 2010. Associated Press reported dozens of deaths by Egyptian security forces. Associated Press, 29 April 2010. Egypt's authorities denied the claims.

31. Interview, tunnel operator, Rafah, April 2010.

32. Associated Press, 22 July 2010. By the scheduled date of completion a year later, only half the length had been dug. Associated Press, 29 April 2010.

33. BBC Online, 6 May 2010; Reuters, 11 May 2010.

34. Tunnel operators and TAC officials cited highly placed interests in Cairo as well as petty officials who took a cut to facilitate traffic. Interviews, Rafah, April 2010. According to operators, Egyptian security officers charge $2,000–$3,000 not to detonate exposed tunnels, or impose similar fines in the event of detonation to cover the costs. "My cousin bought $150,000 worth of carbonated drinks, and half an hour before its dispatch to Gaza, the police seized his truck. Not only did he lose the consignment, he had to pay the police the costs of transport to the dumpsite and the wages of the laborers who destroyed it." Interview, Gaza wholesaler, Rafah, April 2010. "If Egypt really wanted to shut the tunnels down, it could easily do it." Interview, fuel distributor, Rafah, April 2010.

35. *Al-Masry al-Youm*, 17 June 2010.

36. Interview, tunnel operator, Rafah (Egyptian side), July 2011.

37. For instance, Bedouin gunmen opened fire on Egyptian forces after they seized a consignment of tunnel-bound cars. BBC Online, 7 July 2010.

38. The Rafah municipality reduced license fees to facilitate investment for tunnel repairs but still fined operators for late payment. The incentives led to a brisk trade in damaged tunnels. To repair a tunnel 950 meters long and 22 meters deep damaged during Operation Cast Lead cost about $40,000.

39. A twenty-five kilogram bag of rice entering via Israel costs between NIS 50 and NIS 85 via the tunnels; wheat flour is 40 percent less; and some chemical fertilizers are less than half the price. "Eased or Uneased: One Year On," World Food Programme report, June 2011.

40. Interview, Abu Muhammad, tunnel owner, age 47, Rafah, April 2010.

41. Wholesalers surveyed in April 2010 reported that the tunnels accounted for 68 percent of all goods available in Gaza's markets, including 90 percent of all construction goods, fuel, and household appliances, 70 percent of its clothes and office supplies, 60 percent of its food, and 17 percent of medicines. One in four merchants stocked goods solely transported via the tunnels.

42. According to UN Habitat, Gaza needs 60,000 housing units, requiring 158,450 truckloads of cement.

43. Interview, 'Ala' Rif'ati, Hamas's National Economy Minister, Gaza, October 2011.

44. Interview, UN official, Gaza, May 2012.

45. World Bank Ad Hoc Liaison Committee report, 14 September 2011, p. 7.

46. "Labour Market in the Gaza Strip," published by UNRWA in December 2011, p. 3. Derived from data compiled by the Palestinian Central Bureau of Statistics (PCBS), the report said employment in Gaza grew by 21 percent in the year to mid-2011. PCBS figures in Gaza measure only for the formal economy, and some economists say they overestimate actual unemployment.

47. In 2007, it cost $100,000 to construct a 300-meter tunnel with a daily capacity of 40 metric tons; by 2010, $100,000 could buy a tunnel four times the length carrying four times the capacity.

48. A major food wholesaler in Gaza reported that whereas he imported

95 percent of his stock through the tunnels at the height of the blockade, by the end of 2010, 85 percent of his imports came from Israel.

49. See "Easing of Gaza Blockade Leaves Many Smugglers Idle," Associated Press, 2 November 2010. As of May 2012, half remained closed. Interview, economist, Gaza City, May 2012.

50. Interview, Ali Abu Shahla, Gaza City, May 2012.

51. "Youth are denied the chance to meet others outside their own community, to broaden their horizons, experience new cultures, or see things from a different perspective." Interview, Christopher Gunness, UNRWA spokesman, May 2012.

52. "Egypt Stops Building Steel Wall along Gaza," UPI, 13 April 2011.

53. "If you didn't pay, they'd imprison you." Interview, tunnel operator, Rafah (Egyptian side), July 2011. He claimed that he was strung from his arms during ten days of detention and made to pay a bribe of £E (Egyptian pound) 250,000 ($45,000) to avoid his five-year prison sentence.

54. In May 2011, Egypt's ruling military council increased the numbers of Palestinians allowed into Egypt through the Rafah terminal from an average of 250/day (sanctioned in response to Israel's easing of closures following the flotilla incident) to 600/day.

55. According to the World Health Organization, sixty-three people including twenty-two children died waiting to access medical care outside of Gaza between February 2008 and June 2010.

56. "Gaza's Tunnels: The Burrowing Business," *The Economist*, 10 August 2011.

57. In five years of siege, only 1,156 trucks of exports left Gaza via Israel's crossings, whereas the 2005 AMA provided for 400 trucks/day of exports to leave Gaza. Data collated from UN OCHA website.

58. *Al-Ahram*, 11 December 2011; *The Jerusalem Post*, 11 December 2011.

59. Observed by author, "A kilo of watermelon in Gaza costs less than £E 1 (Egyptian pound), while in Egypt it costs over £E 2; a kilo of tomatoes in Gaza costs less £E 0.5, while in Egypt it costs £E 1.5; a kilo of potatoes in Gaza costs £E 0.5, while in Egypt it costs £E 2; a kilo of onions in Gaza is £E 1, while in Egypt a kilo of onions is £E 1.5; a kilo of garlic in Gaza is £E 10, while in Egypt it is £E 15. A kilo of chicken in Egypt is £E 20 lira, and in Gaza it goes for only £E 10. The average price of a kilo of beef in Egypt is £E 60, while in besieged Gaza it goes for £E 5. A tray of eggs in Egypt is £E 19, while in Gaza it is only £E 10." Muhammad Hamadi, *Roz Al-Yousuf*, 29 June 2010.

60. Prior to June 2007, Gaza's textile, furniture, and agricultural exporters relied on marketing to Israeli manufacturers or merchants who would buy from Gaza producers and market in Israel, the West Bank, or abroad.

61. Mai Yaghi, "Gaza Tunnellers Turn Former Lifeline into Export Channel," Agence France-Presse, 18 October 2010.

62. Gaza also imported substantial quantities of Egyptian-subsidized wheat flour. See "From Eased or Uneased: One Year On," World Food Programme report, June 2011. However, Gazan economists noted that Egypt's subsidy bill was offset by some $250 million/year Gazans paid in customs and sales taxes on goods from Egypt. Interview, Gaza City, May 2012.

63. According to the PCBS, the average median daily wage in Gaza was NIS 56.9 ($15) in the first quarter 2010, http://www.pic-palestine.ps/userfiles/file/pdfs/labour_force_survey_en.pdf. Heavy demand, particularly ahead of religious holidays, generated higher earnings. In the run-up to 'Id al-Adha, for instance, one tunnel worker claimed he transported thirty sheep a day, earning $10/sheep.

64. Tunnel worker Abu Ahmed, quoted by Maan News Agency, 26 June 2010.

65. "It's nearer and cheaper than Alexandria, and the girls are more liberal." Interview, Rafah (Egyptian side) resident, age 23, July 2011.

66. Then-PA national economy minister Bassim Khoury, quoted *Le Monde*, 10 October 2009.

67. Ghazi Surani, *Al-Hiwar Al-Mutamadin*, Issue 2495, 14 December 2008.

68. Dan Ephron, "Easing the Import Blockade Won't Help Gaza," *Newsweek*, 23 June 2010.

69. Interview, Gaza City, April 2012.

70. On average, it takes seven months for UNRWA to obtain Israeli approval for its projects. Interview, UN official, Gaza, May 2012. Given that the same goods are available from the tunnels, Israeli restrictions "have been rendered futile as a security measure." Interview, Christopher Gunness, UNRWA official, May 2012.

71. Interview, Rafah (Egyptian side), July 2011.

72. Bedouin tribesmen from Rafah reportedly crossed by tunnel to Egypt to pursue a vendetta over a land dispute. After killing several members of the rival Ramailat tribe, they then returned to Gaza. *Al Masry Al Youm*, 14 June 2011.

73. For instance, the tunnels enabled the government to circumvent U.S.-led international finance restrictions aimed at restricting Hamas government access to hard currency by importing goods such as laptops via the tunnels and selling them at cost. Its regulatory authority further enables the government to wield considerable clout over the tunnel operators. For instance, the TAC not only required that travelers from Sinai coordinate their arrival by tunnel in advance but assigned them a specific tunnel through which to cross, thus ensuring that preferred operators would reap the benefit.

74. Interviews, Gaza City, May 2010. Hamas constantly updated its tariff schedule to match with the fluctuating range of imports. After the Cast Lead offensive, it began charging tunnel owners hauling construction materials a weekly tax of 1 ton of cement. Interview, tunnel owners, April 2010. By May 2012, it was charging NIS 40/ton of aggregates, and a mark-up of 500 percent on diesel which cost £E 1.1, or NIS0.70 in Egypt.

75. Interview, Huda Naim, deputy head of the PLC commission, October 2011.

76. Interview, Gaza City, October 2011.

77. Under Oslo's 1994 Paris agreement, Israel controls all Palestinian foreign trade and collects Palestinian customs duties on the PA's behalf.

78. Interview, Mazen Abu Amarneh, Rafah, June 2010.

79. Interview, 'Umar Sha'ban, October 2011.

80. Interview, Gaza City, May 2010. "People say there's no difference between the current authorities and the former PA. Both are symbols of luxury and corruption. Gaza's Islamic experiment has failed and become a burden on the people." Interview, Islamic Jihad preacher Abdullah al-Shami, Gaza City, May 2010.

81. Economy minister Rif'ati puts Hamas's monthly current expenditure at $25 million, of which $17 million is raised locally and the rest provided by Iran until mid-2011 and other donors. Gaza's 2011 capital expenditure budget of $450 million is largely unfunded, although local business and some NGOs make indirect tax contributions. Interview, Rif'ati, February 2012.

82. Businessmen estimate total domestic revenues at over $50 million per month, including transport licensing fees ($10 million), land registration ($6 million), municipal and sales taxes, and duties on cigarettes ($5 million).

83. Interviews, Ref'ati, Gaza City, October 2011 and February 2012. His new tax regime slated for introduction in February 2011 targets imports where a locally manufactured alternative exists: wooden furniture, carbonated drinks, chocolates, and biscuits. It also imposed taxes on cement (20 NIS/ton), aggregates (10 NIS/ton), and steel (50 NIS/ton).

84. The Rafah municipality repeatedly floated introduction of work permits for tunnel laborers, and collection of income tax from which workers are exempt.

85. Maan News, 9 November 2011. Of sixty-four Palestinians reportedly killed in tunnel-related incidents in 2009 alone, thirty-three died as a result of tunnel collapse. Al Dameer Centre for Human Rights, 2 September 2010.

86. Interview, TAC official, Rafah, July 2010.

87. In 2011, manufacturing outputs in Gaza remained only 68 percent of

their 2006 level. UN data, provided May 2012.

88. Data collated from UN OCHA website, http://www.ochaopt.org/dbs/Crossings/CommodityReports.aspx?id=1010003.

89. Interview, Gaza Chamber of Commerce delegate Maher al-Tabbaa, Gaza, February 2012.

90. Interview, Rif'ati, February 2012.

91. Interview, Gaza City, October 2011.

92. Interview, Huda Naim, Gaza City, October 2011.

93. Interview, Mahmoud Zahar following his meeting with Egyptian president, July 2012.