

# Development of structures and trends of anonymous online drug markets

Meropi Tzanetakis & Tanja Bukac

27th Annual Conference of the European Society for Social Drug Research

22–24 September 2016, Goethe-Universität Frankfurt

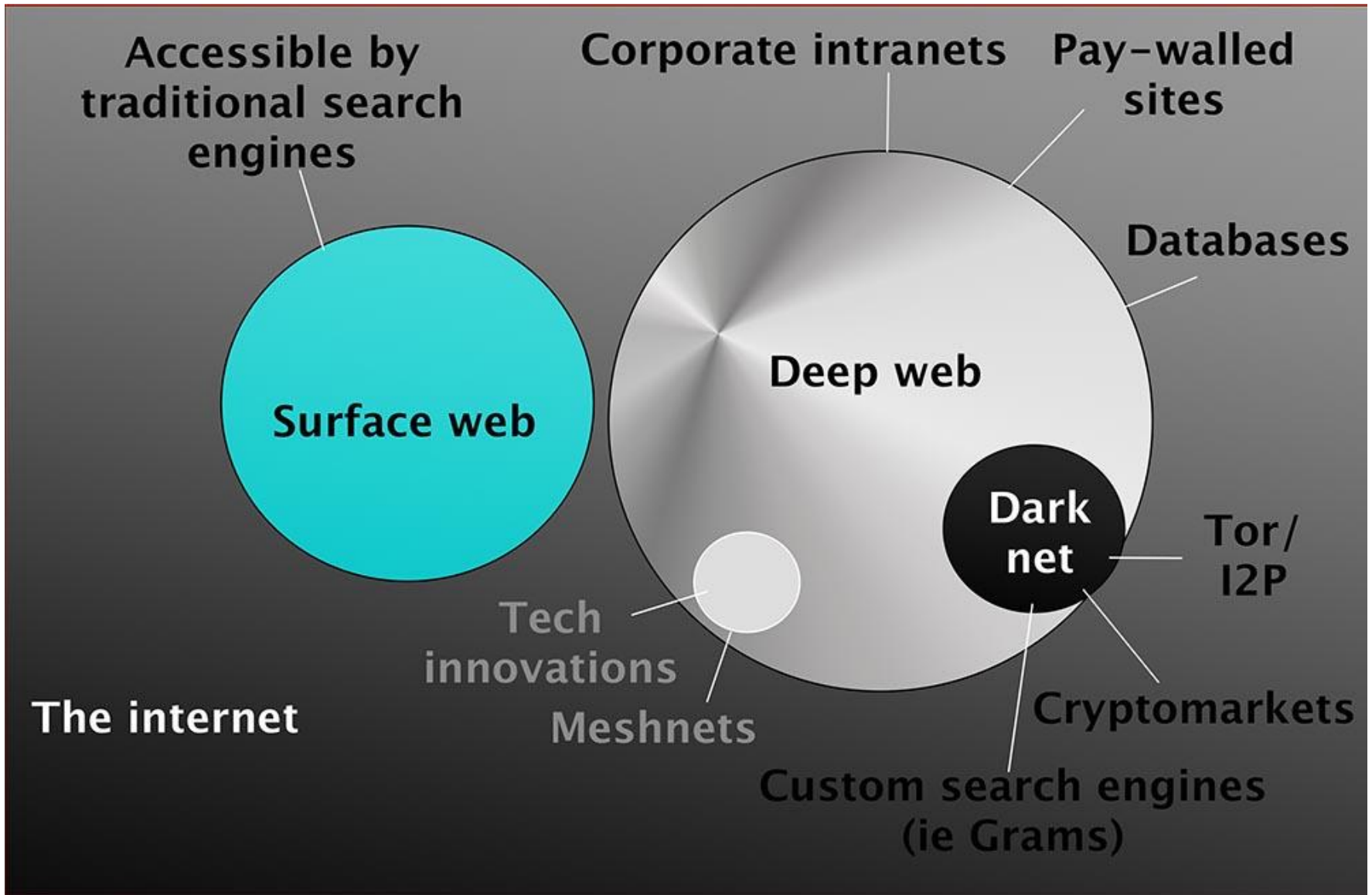


# Overview

---

- What are anonymous online drug markets?
- How did we gather and analyse data?
- What are the outcomes of our analysis?
- Conclusion

# Internet



# What are anonymous online drug markets?



- = digital platforms that use anonymising software and virtual currencies to facilitate trade of goods and services, delivered by traditional postal services
- Innovative technological developments enable systematic drug trading on the internet
- 3 actors are present on platforms:
  - Administrator of a marketplace,
  - Seller &
  - Buyer
- Transactions are processed between seller and an intermediary in case of conflict.



# Data & Methods

- Data were collected between July 2015 and September 2016 on five different darknet marketplaces
- For this presentation we will analyse data on the marketplace Alphabay
- Data generated by developing and applying web scraping-tools
- Data analysis was conducted by using the business-intelligence software Qlik Sense
- Detailed understanding of the development of types of goods being offered, number of deals and distribution of vendors

### Browse Categories

|                                     |                    |       |
|-------------------------------------|--------------------|-------|
| <input type="checkbox"/>            | Fraud              | 9654  |
| <input checked="" type="checkbox"/> | Drugs & Chemicals  | 30745 |
| <input type="checkbox"/>            | Benzos             | 2442  |
| <input type="checkbox"/>            | Cannabis & Hashish | 9009  |
| <input type="checkbox"/>            | Dissociatives      | 634   |
| <input type="checkbox"/>            | Ecstasy            | 4526  |
| <input type="checkbox"/>            | Opioids            | 2303  |
| <input type="checkbox"/>            | Prescription       | 2304  |
| <input type="checkbox"/>            | Steroids           | 966   |
| <input type="checkbox"/>            | Stimulants         | 5209  |
| <input type="checkbox"/>            | Tobacco            | 149   |
| <input type="checkbox"/>            | Weight Loss        | 87    |
| <input type="checkbox"/>            | Other              | 606   |
| <input type="checkbox"/>            | Paraphernalia      | 218   |
| <input type="checkbox"/>            | Psychedelics       | 2292  |
| <input type="checkbox"/>            | Guides & Tutorials | 4447  |
| <input type="checkbox"/>            | Counterfeit Items  | 1796  |
| <input type="checkbox"/>            | Digital Products   | 3991  |
| <input type="checkbox"/>            | Jewels & Gold      | 536   |
| <input type="checkbox"/>            | Weapons            | 570   |
| <input type="checkbox"/>            | Carded Items       | 969   |
| <input type="checkbox"/>            | Services           | 2178  |
| <input type="checkbox"/>            | Other Listings     | 764   |
| <input type="checkbox"/>            | Software & Malware | 482   |
| <input type="checkbox"/>            | Security & Hosting | 178   |

### Search Options

Search terms:

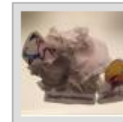
### Search Results [\[Save Search\]](#)



**[MS] [Sticky]** ALL YOU HAVE TO KNOW TO BE SAFE! \*FREE(TO MAKE THIS CC  
Item # 51105 - Cannabis & Hashish / Buds & Flowers - Nesquik7 (3315)

**Buy price**  
USD 0.00  
(0.0000 BTC)

Views: 5988 / Bids: Fixed price  
Quantity left: Unlimited



**[FE 100%] [Sticky]** 5g Amphetamine Paste 100%Speed 74%Pure A++  
Item # 16885 - Stimulants / Speed - DrugsFromGermany (857)

**Buy price**  
USD 33.62  
(0.1027 BTC)

Views: 10241 / Bids: Fixed price  
Quantity left: Unlimited



**[FE 100%] [Sticky]** 3.0mg x50 Pfizer Xanax Bars // FREE SHIPPING  
Item # 36804 - Benzos / Pills - NorcoLorco (328)

**Buy price**  
USD 90.00  
(0.2749 BTC)

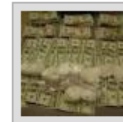
Views: 3946 / Bids: Fixed price  
Quantity left: Unlimited



**[MS] [Sticky]** FB's MED. WEED - PURPLE KUSH (8.5/10) & PINK KUSH (9/10)  
Item # 12192 - Cannabis & Hashish / Buds & Flowers - ferrisbueller (212)

**Buy price**  
USD 62.00  
(0.1894 BTC)

Views: 5882 / Bids: Fixed price  
Quantity left: Unlimited



**[MS] [Sticky]** GET YOUR OWN ITEMMAIL DROP TUTORIAL:USA UK EU INTERN  
Item # 43689 - Cannabis & Hashish / Buds & Flowers - Vinnie (286)

**Buy price**  
USD 15.00  
(0.0458 BTC)

Views: 4720 / Bids: Fixed price  
Quantity left: Unlimited



**[FE 100%] [Sticky]** 10x Grüne Dominos 140mg MDMA Ecstasy Pills  
Item # 45314 - Ecstasy / Pills - DrugsFromGermany (857)

**Buy price**  
USD 59.12  
(0.1808 BTC)

Views: 5513 / Bids: Fixed price  
Quantity left: Unlimited



**[FE 100%] [Sticky]** 3.0mg x100 Pfizer Xanax Bars // FREE SHIPPING  
Item # 40436 - Benzos / Pills - NorcoLorco (328)

**Buy price**  
USD 150.00  
(0.4581 BTC)

# Data collection

---

- Number of listings
- Vendor names
- Number of vendors
- Quantities of products
- Prizes in UDS, EU, ₪
- Customer feedback ratings
- Drug category and sub-categories
- Number of views per listing
- Distribution of payment methods
- Bids
- Number of countries where products are shipped from
- Number of countries where products are shipped to

## What are the outcomes of our analysis?

- Measurement analyses: September 2015 – August 2016
- Estimated total revenues for 12 months: 253 Million USD
- Vendors offering drugs for sale: 3,017
- Active vendors on AlphaBay: 1,151
- Drug listings total: 18,417
- 8,311 drug listings were sold



|                       |            |
|-----------------------|------------|
| Escrow holdings (BTC) | BTC 0.0000 |
| Escrow holdings (XMR) | XMR 0.0000 |
| Total sales           | USD 0.00   |

Note: Escrow funds are held in BTC / XMR. The USD amounts above are provided for your convenience only, at the current rate.

### BUYER STATISTICS

#### Bought items

|                |   |
|----------------|---|
| Items bought   | 0 |
| Items with bid | 0 |

#### Payments

|                 |          |
|-----------------|----------|
| Paid            | USD 0.00 |
| In Escrow       | USD 0.00 |
| Total purchases | USD 0.00 |

### EXCHANGE RATES

#### Bitcoin (BTC)

|                            |        |
|----------------------------|--------|
| United States Dollar (USD) | 593.42 |
| Canadian Dollar (CAD)      | 781.88 |
| Euro (EUR)                 | 532.12 |
| Australian Dollar (AUD)    | 782.55 |
| British Pound (GBP)        | 457.16 |

#### Deposits & Withdrawals

#### Monero (XMR)

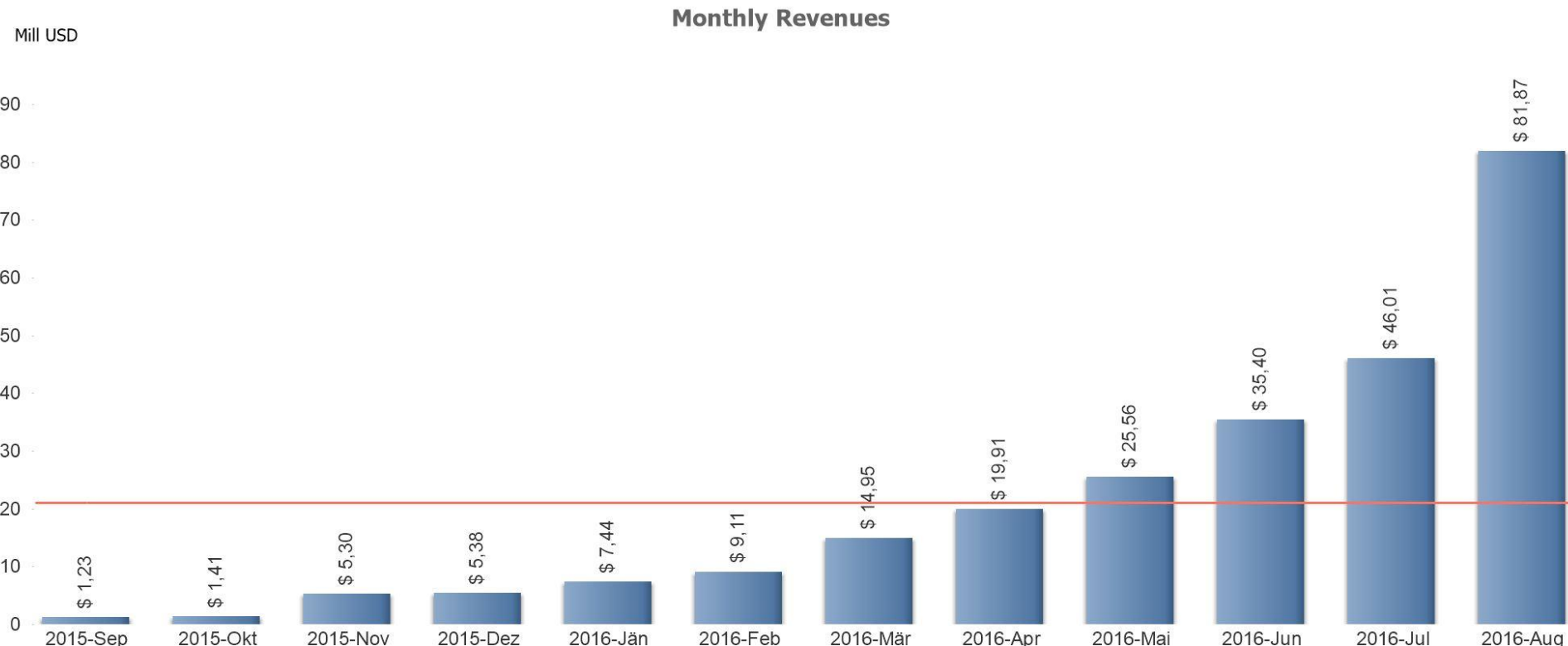
|                            |       |
|----------------------------|-------|
| United States Dollar (USD) | 10.53 |
| Canadian Dollar (CAD)      | 13.87 |
| Euro (EUR)                 | 9.44  |
| Australian Dollar (AUD)    | 13.88 |
| British Pound (GBP)        | 8.11  |

#### Deposits & Withdrawals

The above rates are updated every 10 minutes and taken using a weighted average of major exchange platforms.

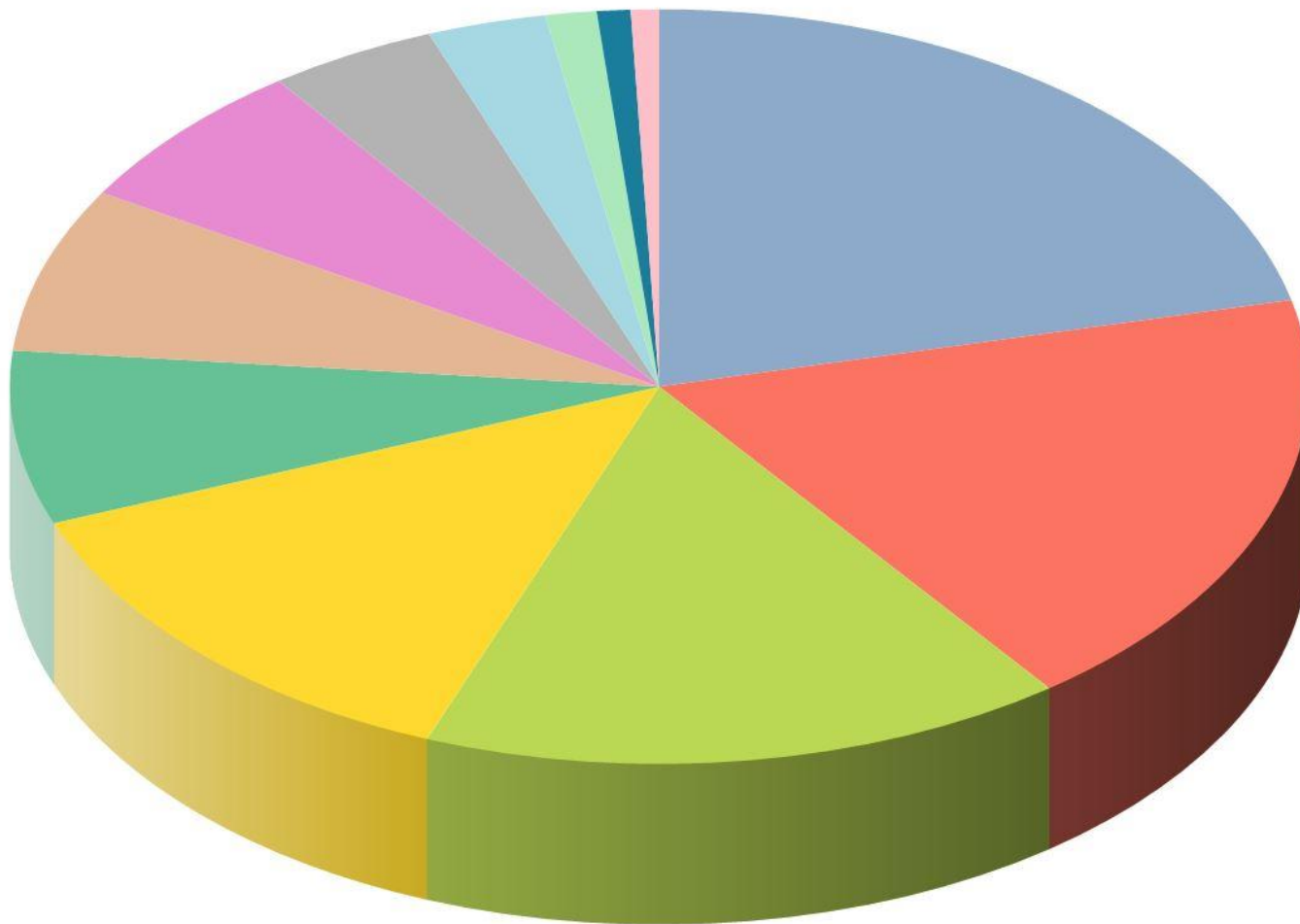
|   |  |       |   |
|---|--|-------|---|
| + | 5DD, good product<br>★★'FERRAGAMO' batch arrived 8TH June is 10/10 ★★ 1G ★ PURE QUALITY PERUVIAN COCAINE ★ UK TO USD 79.9900<br>UK ★ The HONEST Cocaine Company ★ FAST DELIVERY ★★   | j...k | Sep 21, 2016 11:18<br><a href="#">View Item</a> |
| + | Excellent stuff yet again. Top seller<br>★★'FERRAGAMO' batch arrived 8TH June is 10/10 ★★ 0.2g ★ PURE QUALITY PERUVIAN COCAINE ★ UK TO UK ★ The HONEST Cocaine Company ★ FAST DELIVERY ★★  | h...d | Sep 21, 2016 10:45<br><a href="#">View Item</a> |
| + | Great Coke! arrive quickly aswell<br>★★'FERRAGAMO' batch arrived 8TH June is 10/10 ★★ 1G ★ PURE QUALITY PERUVIAN COCAINE ★ UK TO USD 79.9900<br>UK ★ The HONEST Cocaine Company ★ FAST DELIVERY ★★   | a...1 | Sep 21, 2016 01:25<br><a href="#">View Item</a> |
| + | 2nd order and NDD delivery again. Great comms and great product, very strong<br>★★'FERRAGAMO' batch arrived 8TH June is 10/10 ★★ 7G ★ PURE QUALITY PERUVIAN COCAINE ★ UK TO USD 500.0000<br>UK ★ The HONEST Cocaine Company ★ FAST DELIVERY ★★ | k...x | Sep 21, 2016 00:12<br><a href="#">View Item</a> |
| + | As always, perfect in every way.<br>★★'FERRAGAMO' batch arrived 8TH June is 10/10 ★★ 7G ★ PURE QUALITY PERUVIAN COCAINE ★ UK TO USD 500.0000<br>UK ★ The HONEST Cocaine Company ★ FAST DELIVERY ★★   | d...1 | Sep 20, 2016 22:57<br><a href="#">View Item</a> |
| + | Slightly under at 3.38<br>★★ 'FERRAGAMO' batch arrived 8TH June is 10/10 ★★ 3.5G ★ PURE QUALITY PERUVIAN COCAINE ★ UK TO UK ★ The HONEST Cocaine Company ★ FAST DELIVERY ★★  | f...r | Sep 20, 2016 20:54<br><a href="#">View Item</a> |
| + | quick delivery, good stealth and decent product<br>★★'FERRAGAMO' batch arrived 8TH June is 10/10 ★★ 1G ★ PURE QUALITY PERUVIAN COCAINE ★ UK TO USD 79.9900<br>UK ★ The HONEST Cocaine Company ★ FAST DELIVERY ★★                               | s...1 | Sep 20, 2016 20:31<br><a href="#">View Item</a> |
| + | all good as usual! thanks<br>★★ NEW PRODUCT PROMOTION★★ 1G ★ MDMA ★ UK TO UK ★ The HONEST Company ★ FAST DELIVERY ★★   | t...n | Sep 20, 2016 19:08<br><a href="#">View Item</a> |
| + | Ordered NDD. Arrived Next day as always. Best sellers on AB<br>★★'FERRAGAMO' batch arrived 8TH June is 10/10 ★★ 1G ★ PURE QUALITY PERUVIAN COCAINE ★ UK TO USD 94.9800<br>UK ★ The HONEST Cocaine Company ★ FAST DELIVERY ★★                   | s...7 | Sep 20, 2016 18:38<br><a href="#">View Item</a> |
| + | Fantastic as always<br>★★'FERRAGAMO' batch arrived 8TH June is 10/10 ★★ 1G ★ PURE QUALITY PERUVIAN COCAINE ★ UK TO USD 79.9900<br>UK ★ The HONEST Cocaine Company ★ FAST DELIVERY ★★   | s...7 | Sep 20, 2016 18:38<br><a href="#">View Item</a> |
| + | Amazing people!<br>★★'FERRAGAMO' batch arrived 8TH June is 10/10 ★★ 1G ★ PURE QUALITY PERUVIAN COCAINE ★ UK TO USD 79.9900   | t...r | Sep 20, 2016 17:19<br><a href="#">View Item</a> |

# AlphaBay. Montly estimated revenues



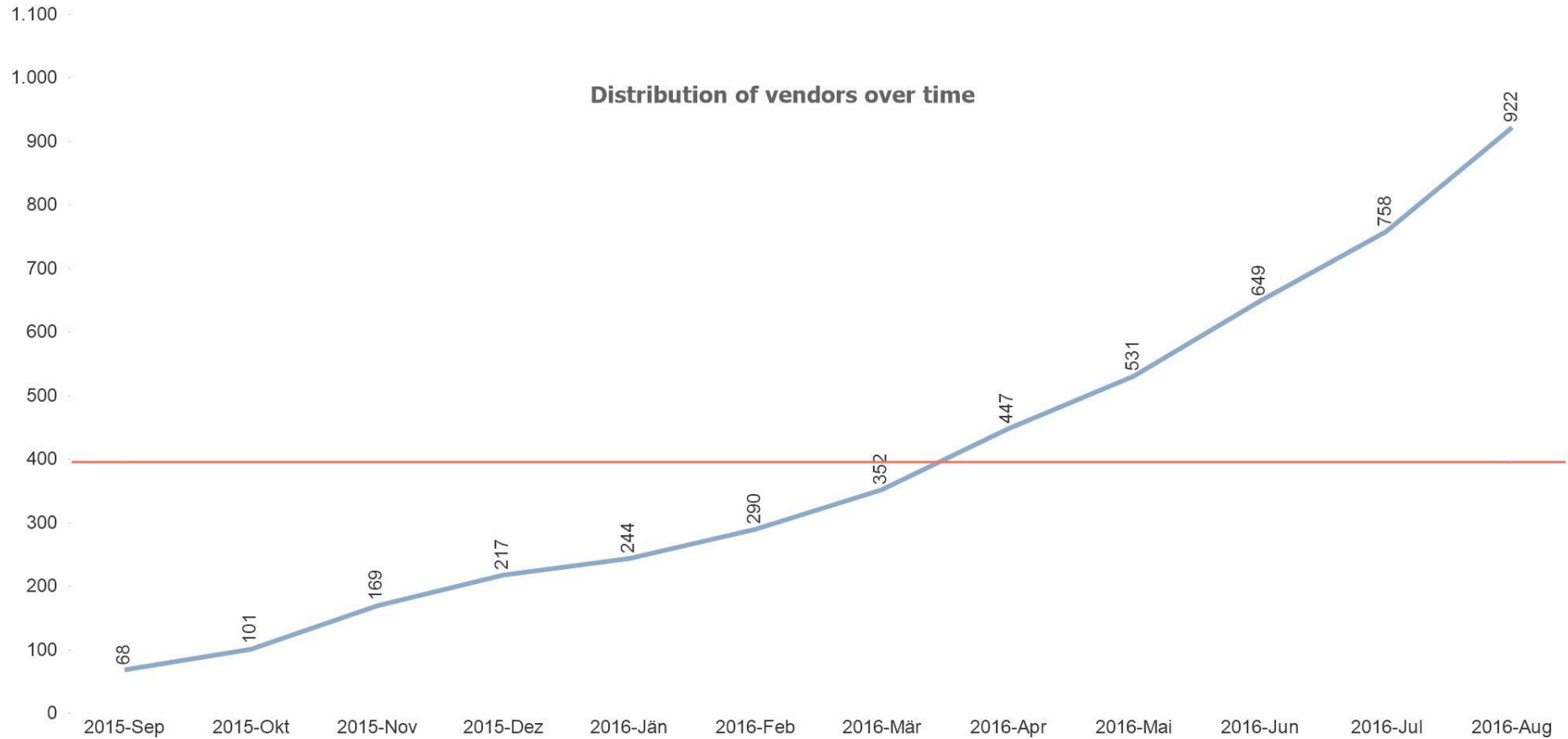
# Revenues per drug category for 12 months

Revenues per drug category

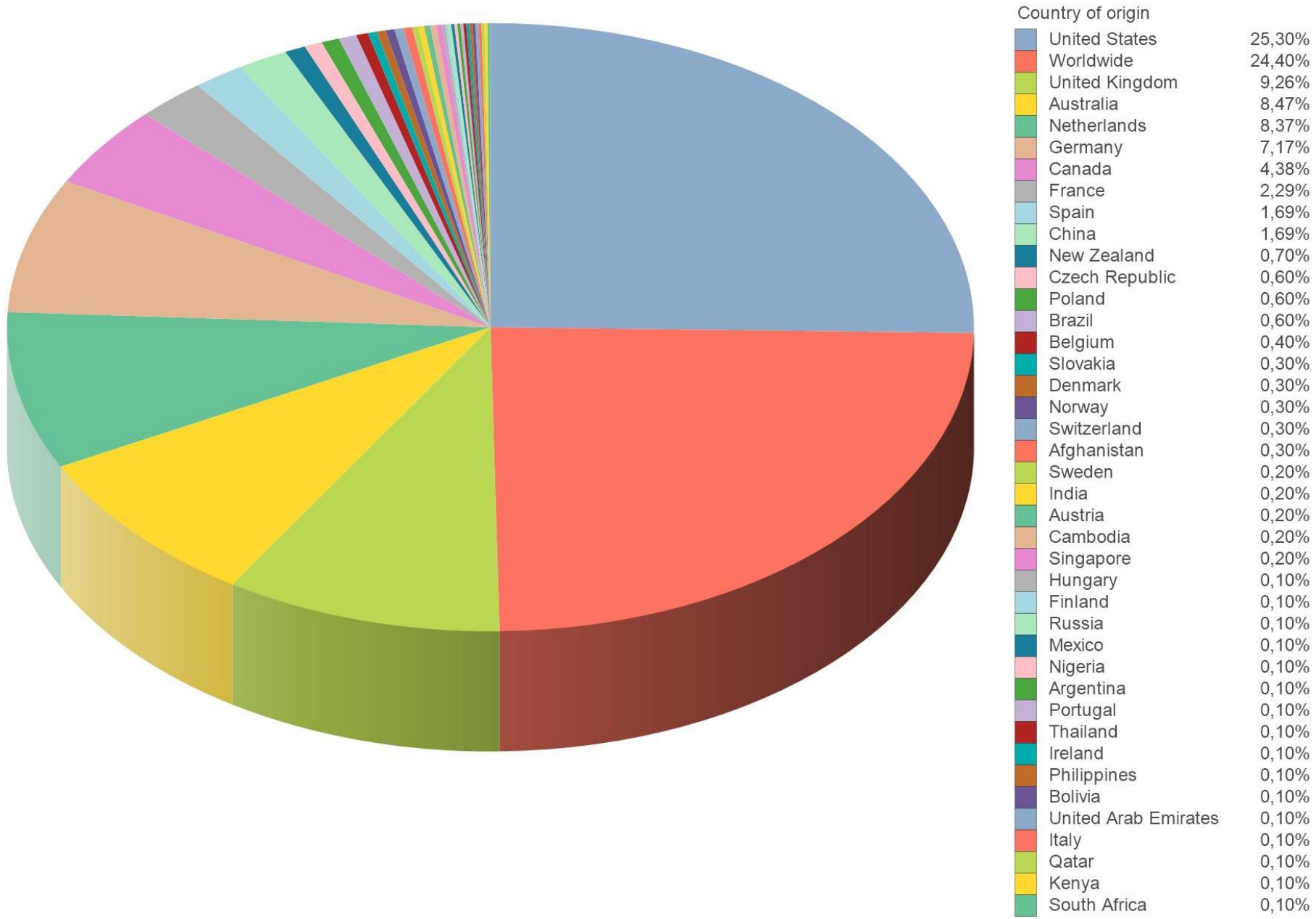


| Kategorie       |        |
|-----------------|--------|
| Stimulants      | 21,31% |
| CannabisHashish | 18,43% |
| Ecstasy         | 16,08% |
| Opioids         | 13,28% |
| Psychedelics    | 7,43%  |
| Benzos          | 7,06%  |
| Dissociatives   | 6,44%  |
| Prescription    | 4,20%  |
| Other           | 2,96%  |
| Steroids        | 1,27%  |
| WeightLoss      | 0,84%  |
| Tobacco         | 0,70%  |

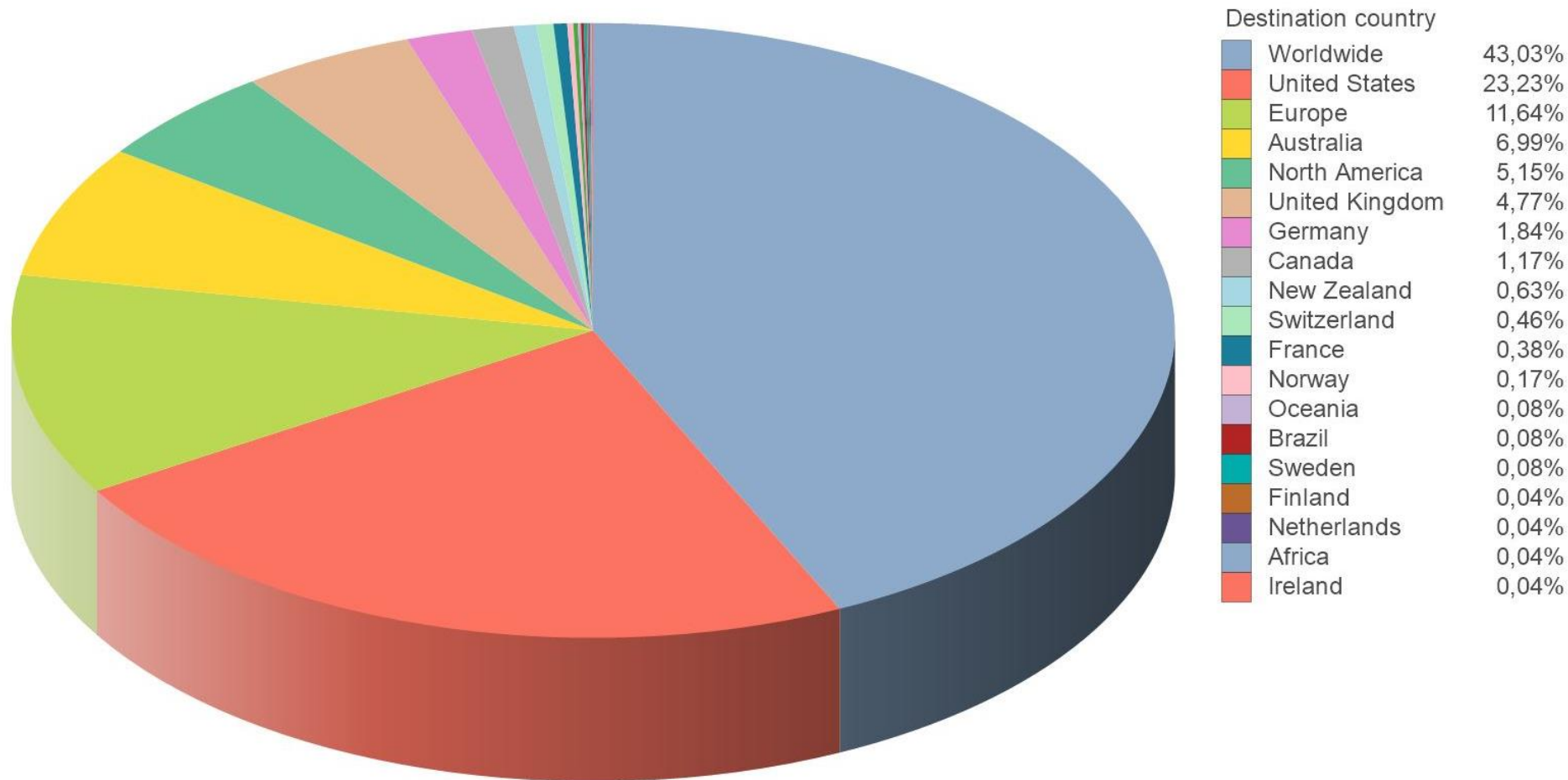
# Distribution of vendors over time



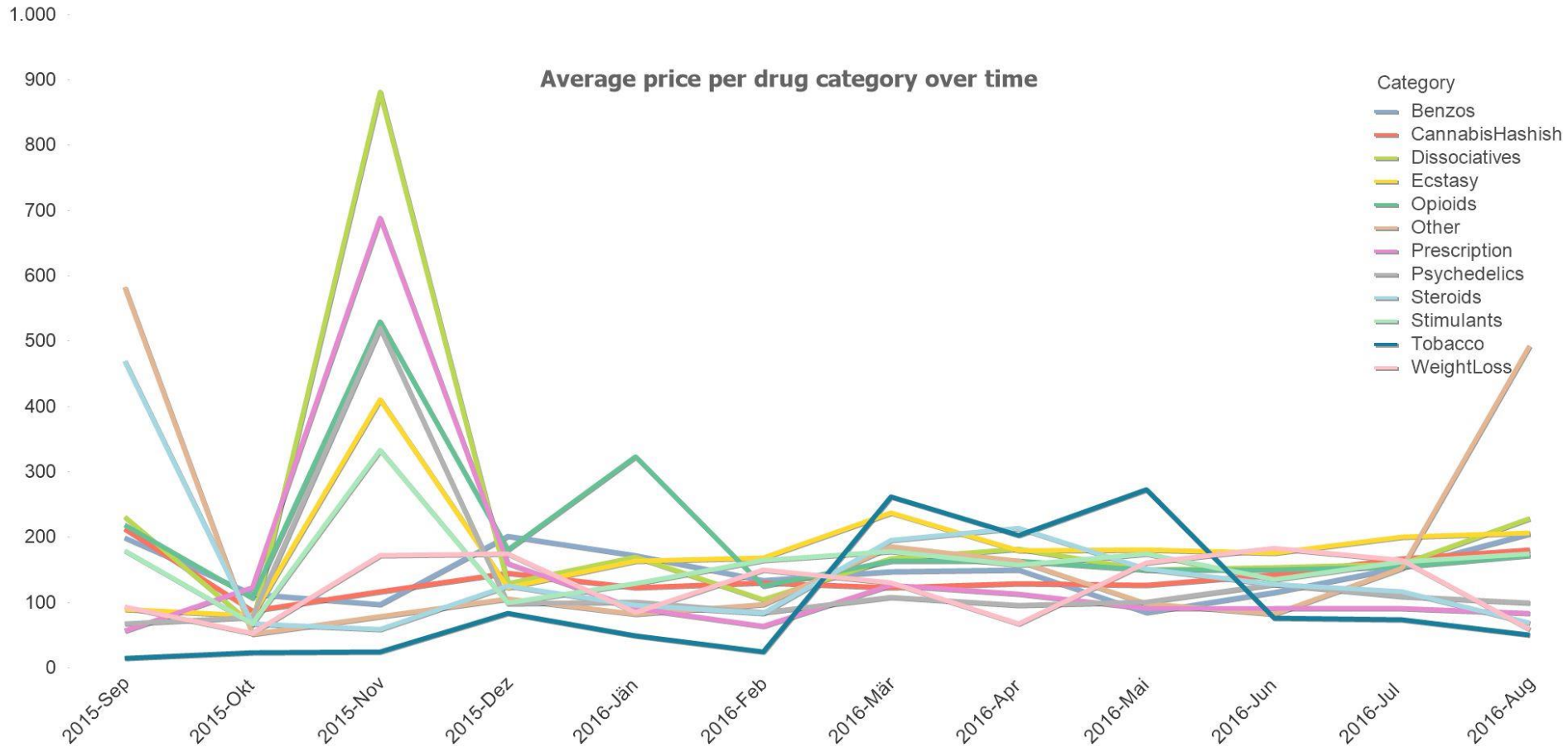
# Countries of origin of vendors



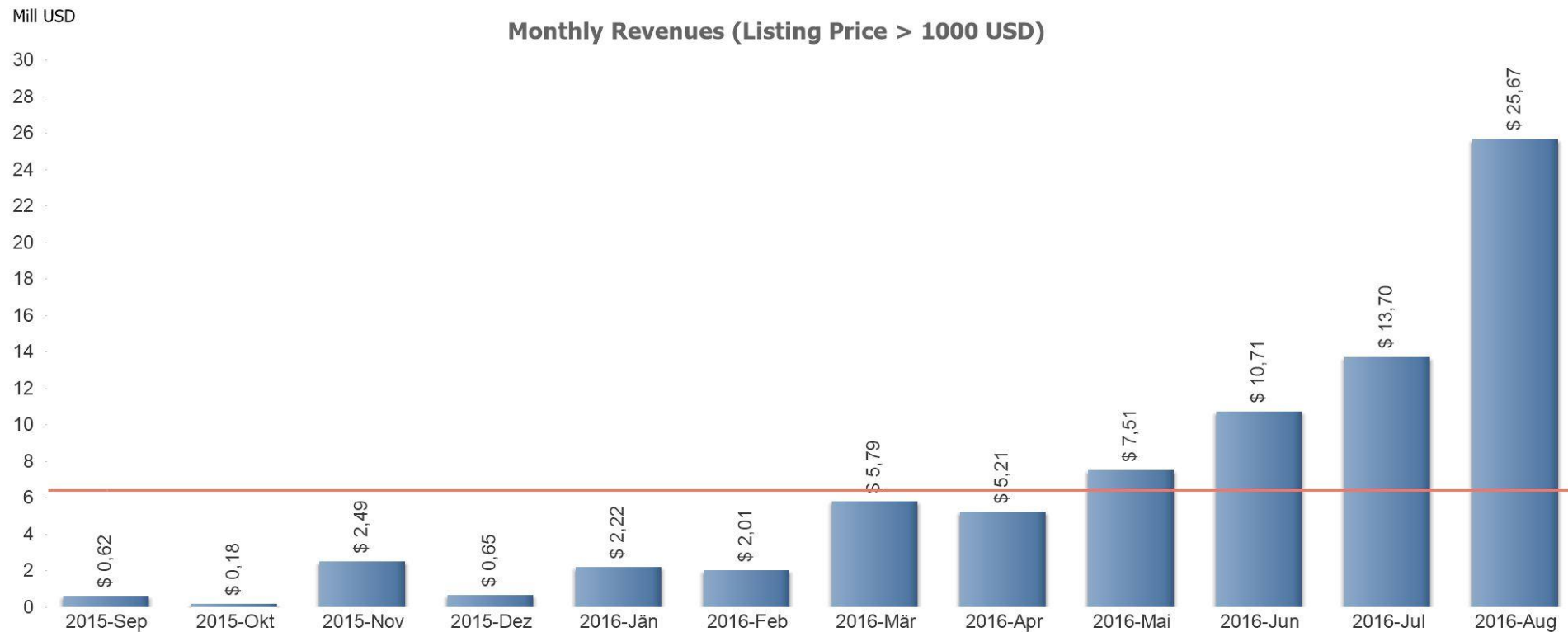
# Destination countries of vendors



# Average price per drug category



# ~~Revenues for listings priced over 1000 USD~~



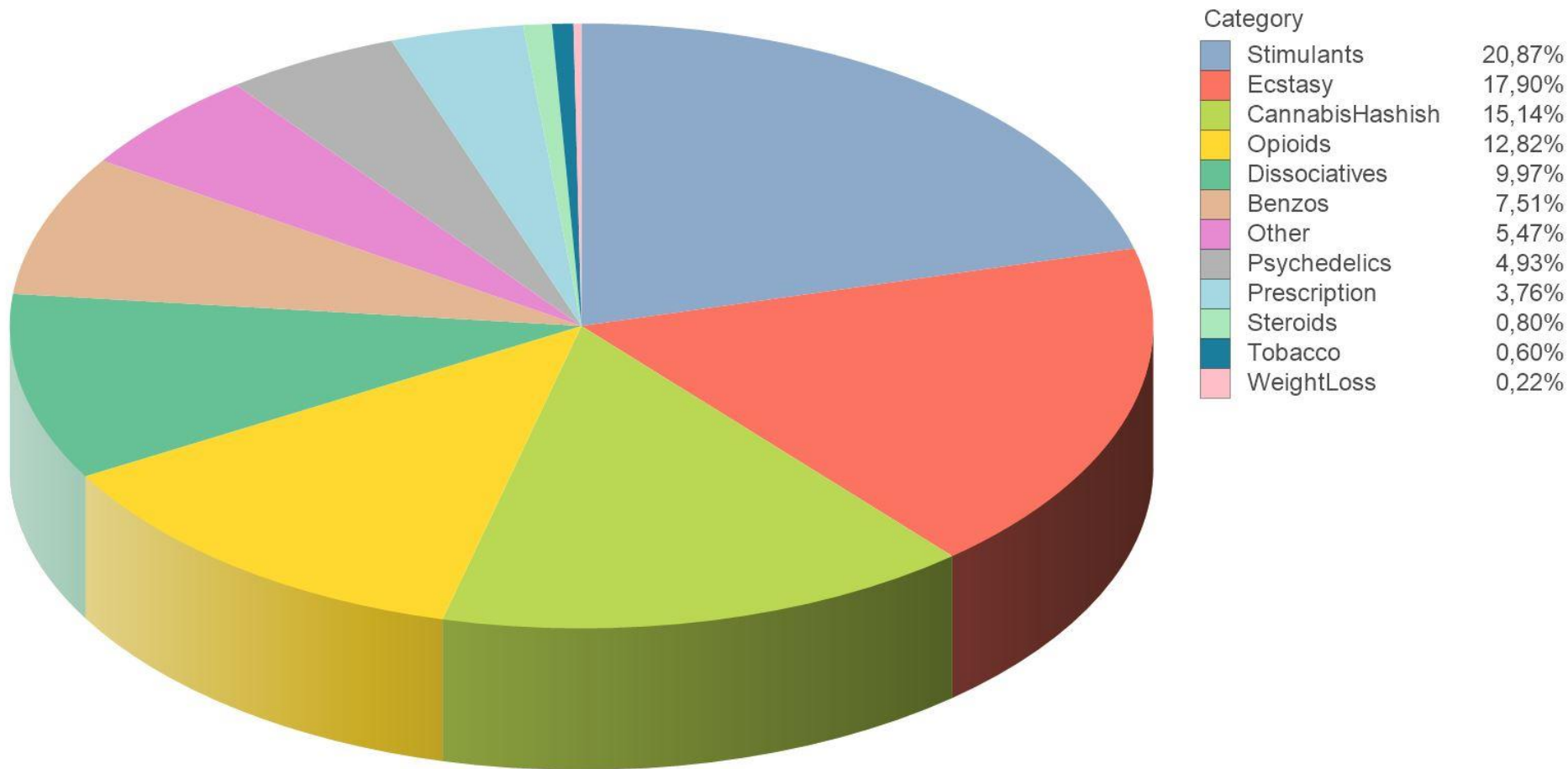


# Revenues for all listings compared to listings priced over 1000 USD



# Revenues per drug category for items priced over 1000 USD

Revenues per drug category (Listing Price > 1000 USD)



# Conclusion

- Anonymous drug markets: sell and buy (illicit) drugs of any kind globally, 24 hours a day, 7 days a week without any physical meeting
- Data were analyzed for the most popular marketplace. Many more competing are online.
- High fluctuation of cryptomarkets
- Revenues and vendors are increasing over time, peak during summer months
- Concentration on US followed by Europe and Australia
- Most popular drugs are stimulants, ecstasy and cannabis.
- Users have an unprecedented possibility to exchange and get information
- Detailed information available on vendors and products
- → Serves a bottom up harm reduction approach
- Practices and features do hardly differ from legal e-commerce companies

# ■ Thanks a lot!

## DarkNet Stats

### Home

- Home
- Sites
- Markets (22 of 25)
  - Agora
  - The Majestic Garden
  - Ramp (Russian Anonymous Marketplace)
  - Valhalla
  - Dream Market
  - Alphabay
  - Tochka
  - Crypto Market
  - Bloomfield
  - French Dark Net
  - IDC
  - TheRealDeal
  - RuTor
  - Russian SR
  - DHL
  - German Plaza
  - Hansa
  - OutLaw
  - Dark Rabbit Market

#### Latest Comments!

View

#### Blog

View

#### Dead Sites

View

#### Advertisement

**BOMGAR** Manage Access to Critical Systems [LEARN MORE](#)

#### Featured Sites

##### Valhalla

Invite here: <http://valhallaxmn3fydu.onion/register/apTR> Established already in October 2013, Valhalla is one of the longest running markets ever. They support true multisig and make it simple to use.

97.07%

[Check Stats](#) 13 comment(s)

Vendor PGP Enforced:  Multisig:  2FA  FE Allowed:

Prior Security Flaws: No Registration: Invite Commission: 2.9-5%

Vendor Fee: 1BTC Monitored: 739 day(s);

##### Dream Market

Alternative URL:  
Ichudifyeqm4ldjj.onion  
jd6yhuwcivehvd4.onion  
t3e6ly3uoif4zcw2.onion  
7ep7ackunzdcw3l.onion

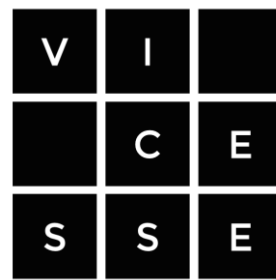
Featured anonymous market platform Using bitcoin transactions to increase anonymity Escrow system to prevent fraud actions Dual rating system to increase trust and business confidence Automatic currency conversion using current exchange rates Messaging system with conversations Seller product and order management system Different shipping prices supported Captcha secured registration und login Support to recover lost passwords with PIN-numbers Password update function chat board for member discussions Verified import of your Black Market

96.88%

[Check Stats](#) 15 comment(s)

#### Recent Statistic

- Tor+Check
- The+Hub
- Bloomfield...



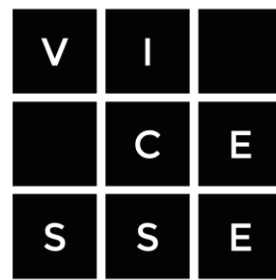
## Dr. Meropi Tzanetakis

- Vienna Centre for Societal Security
- <http://vicesse.eu>
- [meropi.tzanetakis@vicesse.eu](mailto:meropi.tzanetakis@vicesse.eu)



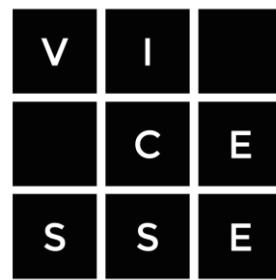
## Tanja Bukac

- Lerox Datenverarbeitung GmbH
- [www.lerox.at](http://www.lerox.at)
- [tanja.bukac@lerox.at](mailto:tanja.bukac@lerox.at)



## Anonymous online drug markets

- **Why are drugs purchased on the darknet?**
- (Barratt et al. 2014)
  
- Anonymous online questionnaire with customers
- 9.470 participants from UK, Australia and USA
- Why did you buy drugs on Silk Road 1?
  
- Wide range of drugs
- Better quality
- Anonymity
- Greater convenience when ordering online
- access to more information about the products & vendors
- Reliece on vendors with high ratings



## Anonymous online drug markets

- **Why are drugs being sold on the darknet?**
- (Van Hout & Bingham 2014)
- Anonymous online interviews with vendors
- Simplicity to set up a vendor account
- Lower risk
- High profits
- Secure and anonymous infrastructure
- Self-description:
  - professional advertising of quality products
  - professional communication and regular forum activity
  - competitive pricing
  - good stealth techniques
  - speedy dispatch of slightly overweight products
  - → positive feedback

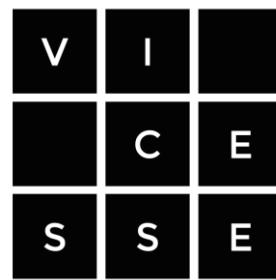
## Anonymous online drug markets

- **Facts and figures**

- Currently 22 marketplaces are online
- 70 % of all sales with cannabis-, ecstasy- and cocaine-related products (2013-2015) (Soska & Christin, 2015)
- Currently largest and most stable platforms: AlphaBay, Dream Market, Silkkitie (Valhalla), Outlaw

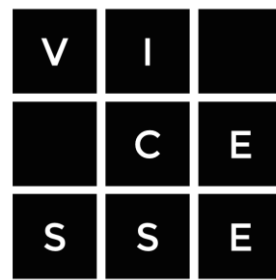
| Name            | Start   | End             | Duration   | Drug offers      |
|-----------------|---------|-----------------|------------|------------------|
| Silk Road       | 2011-01 | 2013-10         | 2,75 Jahre | 24 422 (2012)    |
| Silk Road 2     | 2013-11 | 2014-11         | 1 Jahr     | 1 834 (2014)     |
| BlackMarket Rld | 2011-06 | 2013-12         | 2,5 Jahre  | ~4 000 (04.2013) |
| Agora           | 2013-02 | 2015-08 (Pause) | 2,5 Jahre  | 17 000 (06.2015) |
| AlphaBay        | 2014-12 | online          | 1,4 Jahre  | 22 467 (02.2016) |
| Nucleus         | 2014-10 | 2016-04         | 1,6 Jahre  | 16 439 (02.2016) |
| Dream Market    | 2013-11 | online          | 1,7 Jahre  | 9 937 (02.2016)  |





# Anonymous online drug markets

- **Revenues**
- Estimations of total market volumes
- 1,9 Million USD per month (Christin, 2013)
- annual revenue of over 22 million on Silk Road 1
- September 2013: significant growth in the number of sellers and customers (Aldridge & Décary-Hétu 2014)
- Increased revenues to approximately 90 million USD p.a.
- Silk Road 1: increase of annual sales volume to over 100 million USD for 2013 (Soska & Christin, 2015)
- Estimation of retail market for illicit drugs in the European Union at EUR 24.3 billion in 2013 (EMCCDA, 2016)
- **Vendors:** 87% of sellers were observed to sell less than 10,000 USD (2013-2015) (Soska & Christin, 2015)
- 2% of vendors managed to sell more than 100,000 USD


















## Why would you trust an unknown stranger?

- **Customer feedback system**
- Buyer submits a review on the product and service of the transaction
- Feedback system enables trustworthy interaction between vendors and customers who do not know their identities and locations
- Source for conflicts between all actors
- Review includes numerical rating and a written feedback
- Cover: customer satisfaction with the quality and quantity of the drug,
  - the shipping time,
  - stealth techniques used to conceal the product,
  - packaging when shipping or the responsiveness of the vendor, and communication with vendor
- Vendors seem to put great emphasis on receiving positive feedback

# Customer feedback system

- Profile page of a vendor

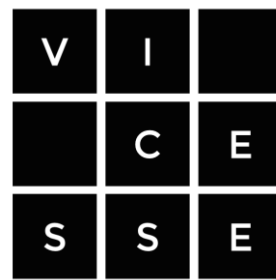
| Product Image   | Product Name & Description  | Price (BTC)    | Origin & Shipping  | Vendor Feedback   |
|---|---|----------------|--|---|
|    | <b>GUCCI KUSH / 5 GR. / A+++ / FREE SHIPPING / ONLY FE</b><br>Neuer Batch aus den Niederladen, sehr Potent , schöne Buds, wie immer nur Top Qualietät.                                | 0.28663101 BTC | From:  Germany<br>To: Germany   |  elchako0705<br>4.69/5,<br>300~500 deals   |
|    | <b>JACK HERER / 10 GR. / COFFEESHOP BOMB / FREE SHIPPING / ONLY FE</b><br>Frisher Neuer Batch, Schöne Buds Schön Fruchtig und Herb. Direkt vom Coffeeshop Zulieferer. ! A+++ Qualität | 0.56898395 BTC | From:  Germany<br>To: Germany   |  elchako0705<br>4.69/5,<br>300~500 deals   |
|    | <b>O.G KUSH / A+++ / 3 GR. / FREE SHIPPING / ONLY FE</b><br>Frisher Neuer Batch OG Kush , Nur super schöne dicke potente Buds in gewohnter Qualität .                                 | 0.16684491 BTC | From:  Germany<br>To: Germany   |  elchako0705<br>4.69/5,<br>300~500 deals   |
|   | <b>JACK HERER / 25 GR. / COFFEESHOP BOMB / FREE SHIPPING / ONLY FE</b><br>Frisher Neuer Batch, Schöne Buds Schön Fruchtig und Herb. Direkt vom Coffeeshop Zulieferer. ! A+++ Qualität | 1.20641711 BTC | From:  Germany<br>To: Germany |  elchako0705<br>4.69/5,<br>300~500 deals  |
|  | <b>WHITE WIDOW / 100 GR. / A +++ / FREE SHIPPING / ONLY FE</b><br>TOP A +++ QUALIETY FROM NETHERLANDS ( COFEESHOP VENLO)  | 3.75187165 BTC | From:  Germany<br>To: Germany |  elchako0705<br>4.69/5,<br>300~500 deals |



# Customer feedback system

- Positive and negative feedback

|     |  |  |             |                            |
|-----|--|--|-------------|----------------------------|
| 5/5 | Fast domestic shipping, amazing stealth lol! Thanks guys!!   | ☆☆☆72% speed<br>10 gram 20 euro !!!                      | 3 days ago  | anon  6~10 deals           |
| 5/5 | top vendor! will order again...got a little bit more :)  | 25 gram ☆ 72%<br>SPEED ☆ 40 euro                         | 3 days ago  | anon  ~5/5,<br>3~5 deals   |
| 2/5 | received only 3g instead of 5. very slow communication to resolve this, after almost a month now he doesn't seem to care anymore | WHITE WIDOW / 5 GR. / A +++ /<br>FREE SHIPPING / ONLY FE | 82 days ago | anon  ~5/5,<br>15~25 deals |



## Third party conflict resolution

- No third-party conflict resolution with physical drug dealing
- Solve disputes and prevent fraud between all actors
- Aim: Increase both reputation and income
- Centralised escrow system was introduced on Silk Road 1
- A dispute resolution is offered by the third party to solve a conflict between buyer and seller if necessary
- Shortcoming: administrator is in a powerful position.


# Centralised escrow system

**Ag** Agora Beta [REDACTED] :: \$ 234.03 USD

Listings Profile Wallet Orders Forums Info/Help 0 NEW MESSAGES LOGOUT

[VENDOR PAGE](#) >

Payments are currently not working, we are resolving the situation.

 [REDACTED] 4.71/5, 300~500 deals  
Registered 1 years 1 months ago.  
Last seen 0 days ago.

☆Before you order please READ our profile page! FREESHIPPING

100% RESHIP OR 50% REFUND ON TRACK ORDERS ! FREESHIPPING

---

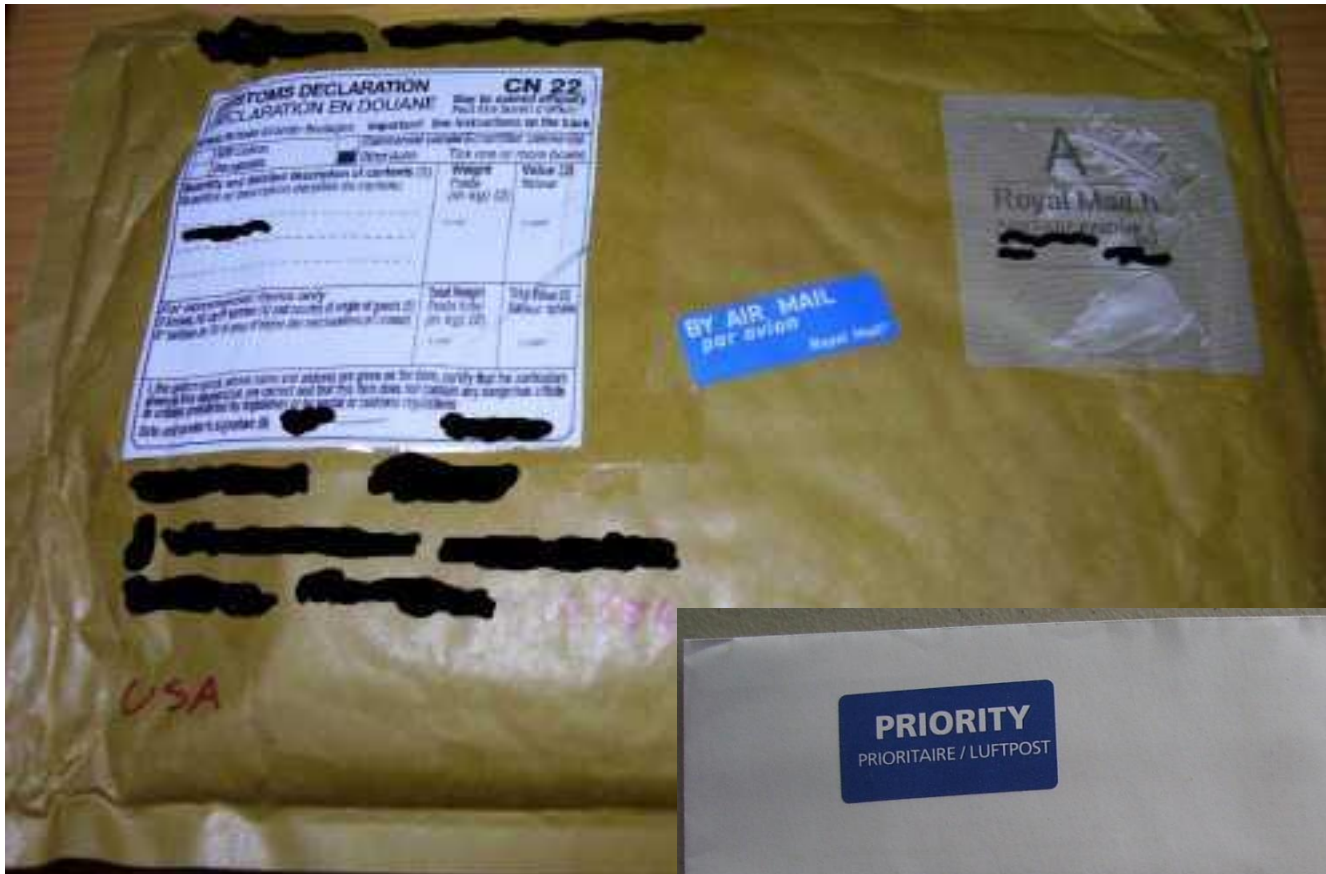
- ★ AMNESIA HAZE
- ★ COCAINE HQ uncut 9+ ★☆☆☆☆☆☆☆☆☆ESCROW !!!
- ★ MDMA crystal rocks pure White 84%★☆☆☆☆☆☆☆☆☆ESCROW !!!
- ★ SPEED paste 72%★☆☆☆☆☆☆☆☆☆ESCROW !!!
- ★ WHITE WIDOW★☆☆☆☆☆☆☆☆☆ESCROW !!!
- ★ XTC pills 200-220mg pure MDMA "CLOCKS"★ESCROW !!!

---

## Agreement by two out of three

- **MULTI-SIGNATURE ESCROW**
- **TWO OUT OF THREE PARTIES (OPERATOR, SELLER, BUYER) HAVE TO AGREE ON SIGNING A TRANSACTION**
- **MOST SECURE TRANSACTION PROCESS AVAILABLE**
- **TECHNICALLY DEMANDING FOR ALL PARTIES INVOLVED**
- **NOT MANY PLATFORMS OFFER MULTI-SIG.**

# Logistics





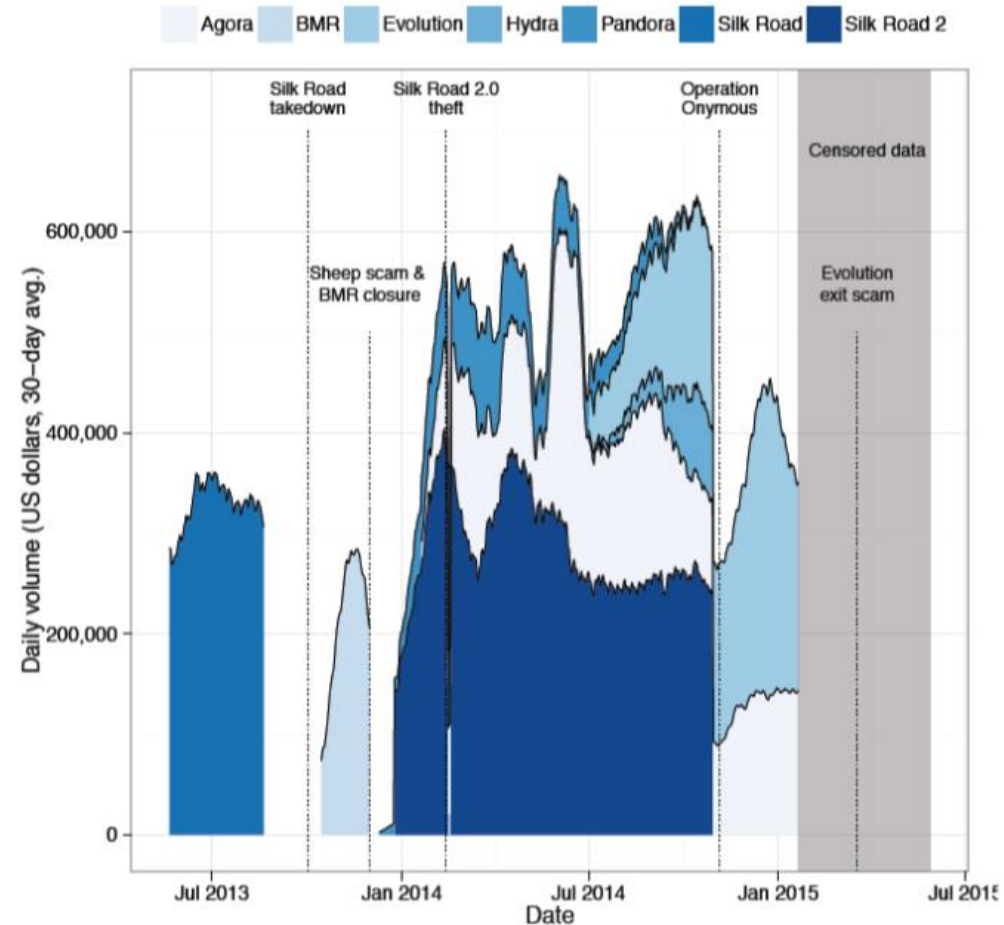
|   |   |   |
|---|---|---|
| V | I |   |
|   | C | E |
| S | S | E |

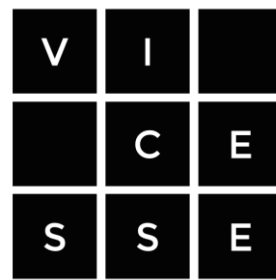
# Harm Reduction

- **Schadensminimierung (Harm Reduction) durch online Drogenmärkte?**
- Erweiterung des Harm Reduction-Ansatzes um eine Bottom-up-Perspektive von Konsumierenden
- 1) Anonyme Bewertungssystem und Diskussionsforen:
  - Neue Möglichkeiten zum Einholen von Informationen
  - Erfahrungsaustausch über Substanzen und Händler
  - Austausch über Wirkungsweisen und Dosierempfehlungen (wichtig bei NPS)
- 2) Konsumierende nicht dem Risiko auf der Straße ausgesetzt
- → Bottom-up-Technologie des Internets →
- Einbeziehen von Wissen und Erfahrungen von (erfahrenen) Peers

# Marktentwicklungen

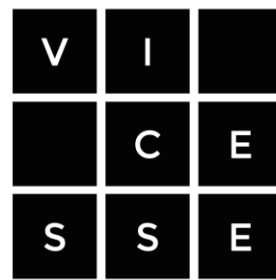
- Hohe Fluktuation der Marktplätze
- Steigende Umsätze
- Operation Onymous: kein Rückgang von Umsatzvolumen
- Technische Sicherheitsaspekte
- Bezahlssysteme
- Infrastruktur: dezentrale Marktplätze
- Erweitertes Sprachangebot
- Clearnet-Märkte
- Einzelshops von Anbietern





## Wie funktionieren online Marktplätze?

- **Lieferung**
- Keine persönliche Interaktionen
- Verkäufer bestimmt Länder, Kontinent
- Zustellung per traditionellem Postdienst
- → ohne deren Wissen
- Unterschied ob Versand international oder innerstaatlich: Zoll
- unauffällige äußere Verpackung



## Customer feedback system

- **How is trust increased?**
- dispatching illicit drugs of high quality
- stealth used to conceal the content of the delivery
- fast replies by the vendor and
- short shipping time

# Conventional Definition of Data Quality

- Accuracy
  - The data was recorded correctly.
- Completeness
  - All relevant data was recorded.
- Uniqueness
  - Entities are recorded once.
- Timeliness
  - The data is kept up to date.
    - Special problems in federated data: time consistency.
- Consistency
  - The data agrees with itself.